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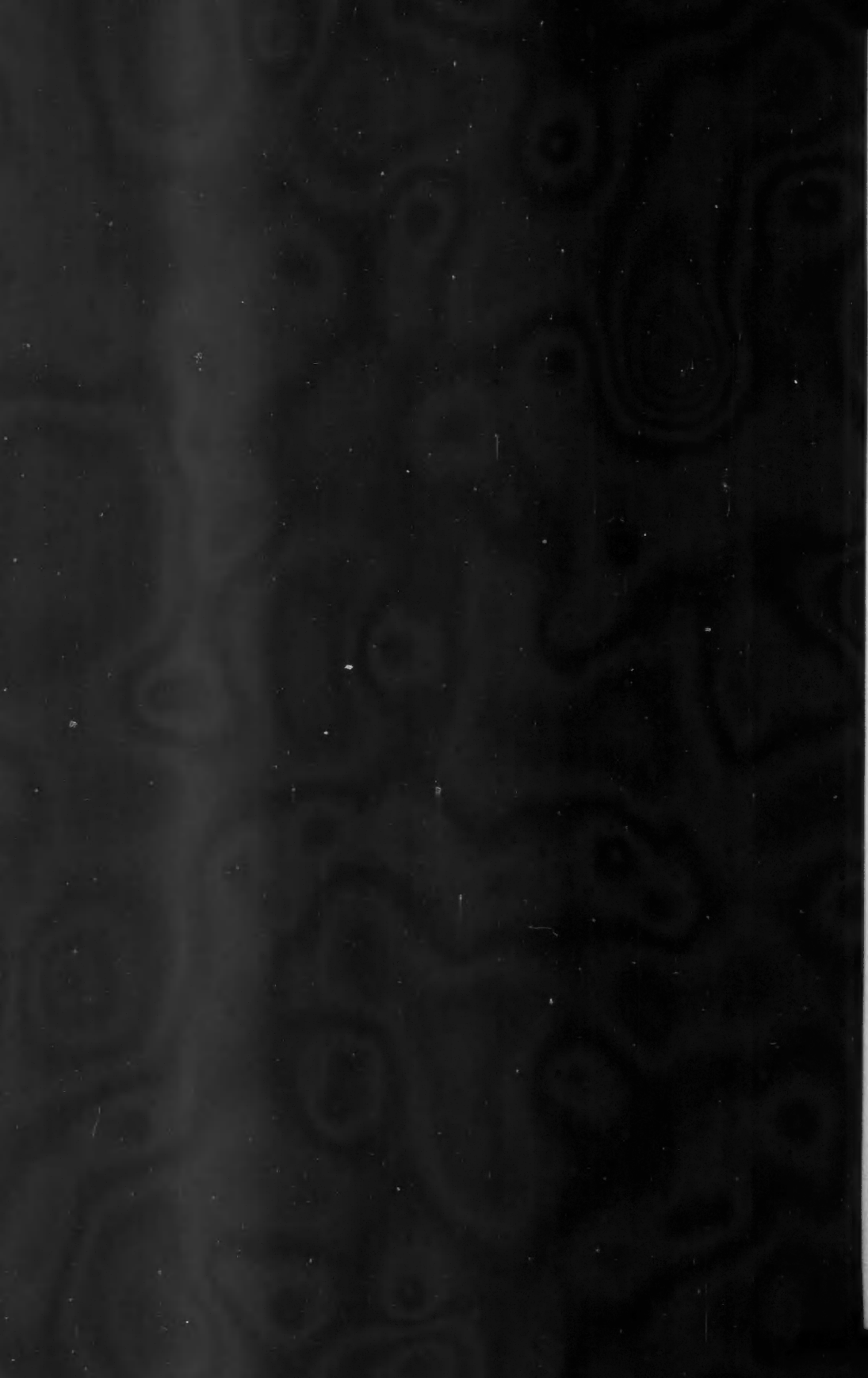
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# *Canadian Journal of* **PUBLIC HEALTH**

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## **The National Health Agency as a Leavening Influence**

JOSEPH W. MOUNTIN, M.D.

*Assistant Surgeon General*

*Associate Chief, Bureau of States Services*

*Public Health Service, Federal Security Agency  
Washington, D.C.*

**I**N any country, the state of public health, be it good or bad, is a product of four specific ingredients: basic knowledge, organization, financial support, and most importantly, motivation—those intangible qualities that stimulate individual and community action. And the goal of public health workers is to see that the proportions of those four ingredients are such as to enable the program to move forward—not merely to spread out.

Of course, there's another important element which affects a nation's health, and that is the level of its general economy. Although this is general, it is such a basic ingredient that it underlies all the rest. And yet it is a product of as well as a contributor to public health. The level of national economy usually determines, within broad outlines, the level of health; conversely, a high standard of living depends on a high level of health.

The methods used to promote public health in the United States and Canada have been similar because our cultural and economic development has been similar and because we have influenced each other throughout the years. Therefore, in describing experiences in the United States, I have no illusions that I will be presenting novel ideas to you. Rather, it is my hope that a view of public health as it is practiced across the border may add to your perspective on your own programs.

Like you, we in the United States have a high regard for local autonomy. As individuals and as residents of communities, our people like to handle their

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problems in their own way. They are hesitant about accepting the Federal government as a partner in local enterprises, fearing that, in doing so, they may lose some of their freedom—their right to be different. However, with the increased concentration of wealth in limited areas—the inevitable by-product of a mass production economy—it has become necessary to use Federal taxation as a means of equalizing resources. Thus, the national health agency, as well as other units of the Federal government, have, of necessity, become more and more involved in matters that were once purely State or local.

This has presented the Federal government with an opportunity to raise standards and equalize opportunities. At the same time, it has imposed an obligation to preserve local independence and initiative. As a result, the Public Health Service of the U.S. Federal Security Agency has assumed a role that is partly adaptive, partly creative; respecting old traditions, yet introducing new techniques.

One of the most important methods used has been research. It is estimated that about 28 per cent of all medical and related research in the United States is supported by tax funds—about half of which are administered by the Public Health Service (1). Yet the research program of the Public Health Service today relies on the democratic procedure of citizen participation to a far greater extent than it did when it started, back in 1887, with one room, one man, and one microscope. Today, about 13,000 private citizens, representing both scientific and lay groups, participate directly in the research program. Some 76 of them serve on advisory councils where they help to frame basic policies by determining what areas of study give promise of providing the greatest benefit to the greatest number of people. The work of the advisory councils is reinforced by about 20 study sections—composed of experts in their respective fields—who review each proposed project and submit their views to the councils.

Research projects are conducted not only within the U.S. Public Health Service, but in almost 250 non-Federal research facilities located in 44 States, 3 Territories, the District of Columbia and 10 foreign countries. The private citizens whose studies are supported by Federal tax funds have almost complete freedom in pursuing their investigations. They are primarily responsible for results and are subject to a minimum of fiscal accounting (2).

To those who argue that increased Federal activity in the health field necessarily spells encroachment on democratic freedoms, the history of Federally-aided research is clear-cut refutation.

The question might still be asked, however, as to whether there has been any relaxation of other research efforts as Federal support has increased. Here, too, we have an unequivocal answer. Since 1941, during the very period when the Federal government has been most active in this field, private research funds made available to medical schools have increased 341 per cent (3). Moreover, the base of support has widened. Where formerly medical research depended primarily upon the philanthropy of the very rich, today it is supported in large measure by popular subscriptions through such organizations as the National Cancer Society, the American Heart Association, and the National Foundation for Infantile Paralysis. The man on the street, with his dime and his quarter, is investing in research. More and more, it is becoming a people's program. While

some see a danger in this, fearing that if dramatic results are not rapidly gained, the public may grow impatient and hostile, it seems to me far more likely that the effect will be to make the public more alert about using new knowledge once it is discovered. We use what we pay for!

I should like to go outside the health field for an illustration of the manner in which the public has supported research conducted under official auspices. Agricultural research has, almost from the very beginning, been largely government-supported in the United States. The research has been extremely productive and of almost uniformly high quality. Moreover, our farmers have not only supported it over a long period of time but have been eager to put its results into practice.

Coming back to public health, we have a recent example of a similar type of eagerness in the popular reaction to the sodium fluoride discoveries in curbing dental decay. Undoubtedly, the reason that a growing number of communities in our country are adding sodium fluoride to their water supplies can be laid to an understanding and appreciation of the research discoveries.

The role of the U.S. Public Health Service in the dental topical fluoride program illustrates two other methods that have been used nationally to enhance the services which State and local health departments and private practitioners are able to provide. These methods are field studies and demonstrations, both of which, I know, are as familiar to you in Canada as they are to us. It was through field studies, conducted in cooperation with State and local health departments and public school systems in selected areas, that economical and effective methods were perfected for using fluorides as a preventive measure against tooth decay. It was by demonstrations, available to any State that requested a demonstration team, that the Public Health Service helped communities to get this new dental health program under way. These demonstrations encouraged the cooperative efforts of dentists, school and health officials, and lay leaders in developing local action programs.

I believe all of us, individually, have had the experience of feeling baffled and bewildered when called upon to do a job for which we have had no previous experience. There's a human tendency, in such a situation, to throw up one's hands and declare it can't be done. But if someone shows us how, we see that it isn't so hard after all and tackle it with confidence. The national health agency, by the device, in this instance, of training a few demonstration teams, gives people all over the nation that kind of confidence; and jobs get done that otherwise might not even be attempted.

Probably the most controversial, but certainly one of the most effective methods used by our national health agencies, in both countries, to influence public health practice has been the system of financial grants-in-aid. Unlike your program, which went into full-scale operation about three years ago, ours has evolved gradually over a somewhat longer period. The grant programs of the Public Health Service for general health purposes were first authorized back in 1935. With the specialized grants that have since been added, plus the funds for maternal and child health and crippled children, which are administered by the Children's Bureau, our present grant program is very similar to yours. Because of our longer experience, however, some of our findings and conclusions may be of interest to you.

Of first importance, to those who fear that any expansion of Federal activity may bring us one step closer to centralized control, is the question: How has this program affected local initiative, and to what extent has it compelled local conformity? The facts show that far from leaning on Federal aid, States and local communities have used it as a boost and gone on, through their own increased efforts, to hurdle the financial barriers to better public health. There has been a tremendous increase in amounts, from all sources, expended for State and local health services during the past 12 years. According to reports submitted by State agencies administering Public Health Service grants, the total sum has risen from 22 million dollars in 1937 (4)—the first full year of the grant-in-aid program—to 202 million in 1949 (5). Expenditures rose more steeply at the local than at the State level—in 1937, local governments paid 52 per cent of the cost of their own public health services (4); by 1949 the proportion had risen to 66 per cent (5). This high proportion of local support is of itself some assurance that the programs which receive Federal support are not federally controlled.

Probably the best answer I can give you on the question of Federal coercion is that this has never become a practical issue. In fact, it could not occur since the law specifies that the Surgeon General shall consult with the State health authorities in drafting regulations. Moreover, the States may have recourse to the courts against arbitrary or capricious action on the part of administrative officials. I might add that members of Congress also seem to take a particular delight in disciplining Federal officials—and that, in a broad way, is good too.

From the beginning of the grant program, the Public Health Service has maintained consultant staffs in regional offices. These staffs work closely with the health departments of the 3 to 6 States in their regions, bringing them information from other States and regions, passing on to them data supplied from research and field studies, providing technical and consultative services based on an intimate understanding of each State's distinctive needs and problems. Moreover, once a year, the health officers of all States and Territories meet with the Surgeon General of the Public Health Service to discuss basic policies. Here experiences are exchanged, grievances aired, and suggestions offered for amending laws and regulations.

Under this system, it would be difficult to say to what extent the national health agency influences State and local activities and to what extent the reverse is true. The end result, however, is a general agreement on the goals to be reached and the methods to be followed.

A recent editorial in the *American Journal of Public Health* (6) had this to say about the effects of grants-in-aid on Federal-State relationships:

Every now and then an address is delivered, or an essay is written, which views with alarm the fearful prospect of Federal domination of State policies supposedly involved in grants from Washington. It happens that the writer of this editorial has for more than thirty years been a member of a State Public Health Council which has been the recipient of Federal grants; and is in a position to testify that such fears are wholly illusory. . . . It is reasonably certain that if there are faults in the actual operation of the program, they lie in too much, and not too little, deference of Washington agencies to local opinion. . . . It may be suggested that those who lie awake at night in fear of Federal domination have at the bottom of their minds a

different concept of government, which assumes that domination by someone is essential and that such domination can best be exercised by themselves.

Another important question for those interested in strengthening democracy is: Has the grant-in-aid program tended to equalize health opportunities, has it brought the benefits of modern health knowledge to a greater number of citizens?

Such equalization is at least partially assured by the very terms of the legislation which provide that funds are to be derived in greater proportion from those best able to pay, and allotted according to need. Further evidence is the dramatic improvement in the national level of health which has occurred during the period that the grant program has been in operation. And still further evidence is the expansion of public health programs.

Before 1939, as many as 13 States had failed even to establish an organizational unit for the most basic of all public health programs—communicable disease control. All have them today. Where there were only 656 tax-supported venereal disease clinics in 1935 (4), there were 2,008 in 1949 (5). In 1935, only 19 States had identifiable projects in tuberculosis control (4); today they all have them (5). Mass X-ray surveys are now reaching about 14 million persons per year (7).

Local health departments, staffed with full-time, professionally trained personnel, are unquestionably the most important measure of program advancement since they are the basic source of services for the people. Here too, notable progress has been made. In 1935, full-time local services were available in only 762 counties (4); they are now available in 1,734 counties (8).

The special grants for chronic diseases were, I might almost say, thrust upon us. Because we have not discovered primary preventive measures for most chronic disorders, many health officers questioned whether they could be classed as public health responsibilities. However, Congress, sweeping aside all theoretical considerations and administrative niceties, on its own accord decided that there should be programs for research and control in cancer, heart disease, and mental health. The results have vindicated their judgment and proved their far-sightedness. Not only has research in these important fields been vastly expanded, but existing knowledge is being more widely applied by health departments and by schools in their training programs for physicians, medical students, and other health workers.

Our most recent grant-in-aid program—water pollution control and industrial waste studies—brings us back, in a sense, to where public health first started—environmental sanitation. But the modern approach to the health aspects of our environment is something very new and its potentialities are boundless. Water pollution control, important as it is, is just a first step. I believe the future may very well see public health agencies becoming more active in the control of air pollution; in housing; in accident prevention. Research, however, must pave the way. Recognizing this, the Public Health Service, two years ago, established an Environmental Health Center. This new research unit, although primarily concerned at present with industrial waste and water pollution, operates under a broad directive which fosters expansion into other health aspects of the environment—of toxicology, radiation, and other hazards to health either unknown or unappreciated even a decade ago. Nor is interest in the health aspects of en-



vironment limited to physical conditions. What we might call the "social environment" is likewise receiving increasing attention, particularly in the research fostered by our National Institute of Mental Health. Sociologists, anthropologists, and other representatives of the social sciences are among the key advisers on programs and policies of that Institute.

Probably the most popular of all the grant programs has been the aid for hospital construction. In four and a half years, over 1,500 hospitals and health centers, with more than 73,000 beds, have been approved for Federal aid (9). In this program too, local determination of needs, as well as local administration and control, has been the guiding principle. That this program has filled a real need for most of our States and communities is demonstrated by the remarkable speed of hospital planning and construction and by the popular pressure for an increase, rather than a curtailment, of the program.

From a mere examination of the dollar value of these grant programs, some may get the impression that the national health agency is primarily a funds-dispensing body. Such, of course, is far from the case. At least of equal importance to the allotment of funds are our constant efforts to find and improve methods of controlling disease, to develop new techniques, to demonstrate them, and to train health workers in their use. I have already mentioned how field studies, demonstrations, and consultative services bolster and extend the work of State and local health groups. To do this kind of job the national health agency must be ready to make available a wide range of skills and competencies—all of which are not likely to be found in every State or local area. People, knowledge, skill—these are the leavening ingredients supplied by the national agency.

But the unique role of the national health agency carries its range of interests and responsibilities even further. The cooperative work with State, county, and local bodies represents one type of relationship. Then the national health agency has another important type of relationship with such groups as voluntary health organizations, professional societies, schools of medicine and public health, as well as with industrial, labor, consumer, and civic groups. In our complex society, many individuals and groups have a share in the total health job. Progress toward better health is the result of united effort on the part of all the groups who can make a contribution. By helping to set standards, by stimulating more effective services, by working for better understanding, the U.S. Public Health Service occupies a central place in promoting American health. And beyond this, of course, the national health agency has the primary responsibility for working with other nations and international organizations for better health throughout the world.

This review of achievements may perhaps strike you as a typical American success story, except that the U.S. Federal government, and more particularly its Public Health Service, is the central character. Actually, of course, I know as well as you that accomplishment is always interspersed with failure, and if time permitted, I could certainly document that aphorism from our own experience. I will, however, mention briefly our one outstanding failure, namely, our inability, to date, to solve the problem of personnel shortage. All health programs—local, State, and Federal—are hampered because of inability to attract, in sufficient numbers, the kinds of personnel needed to fill the positions already

budgeted, much less the many additional positions which appropriating authorities are willing to establish. Despite an intensive training program, we are actually losing ground.

It was hoped and predicted that the installation of State and local merit systems would remedy the situation, but these expectations have been realized only in part. Frankly, I think we in public health will be hard put to prevent considerable disintegration of our total structure so long as salaries trail the rising cost of living and so long as the output of graduates from the basic professional schools remains grossly deficient as compared with the demands for their services.

Before closing, I also want to offset any impression I may have given you that the course we have pursued in the United States receives universal or uncritical approbation. In fact, a very perceptible reaction has developed against Federal financial grants and the so-called "influence of Washington"—particularly if the two seem associated. It was originally feared that entry of the Federal government into State and local health affairs would have a depressing influence on local initiative and quality of service. The early grant-in-aid acts, for example, contained words to the effect that such aid was intended primarily to stimulate local activity and emphasis was placed on studies, demonstrations, and training. The role of the Federal agency, in brief, was to provide the leaven in the dough. Now, however, the pendulum seems to be swinging the other way. Tax sharing is being proposed instead of conditional grants, with little range being left for the exercise of professional judgment by the administrative officials of grantor agencies. This may signify that greater importance is being attached to funds and less to guidance; in other words, that the people are coming to prefer their dough without the leaven.

In opposition to the principle of Federal grants is the point of view reflected in the recent recommendations of the Joint Committee of Congress which reviewed the 1951 Economic Report of the President (10). This committee felt that Federal aid to States should be held in abeyance during the present inflationary period. It advocated that "the traditional local methods of financing . . . public health should again be more fully relied on" and the report goes on to state that "the role of the Federal government with respect to State governments *might well be reversed*." From other sources it has even been suggested, facetiously perhaps, that the Federal government should be getting rather than giving State aid.

By and large, however, these reactions would seem to represent a fiscal rather than a fundamental philosophical difference. The scope and variety of the health matters which have been considered by the Congress in recent years is probably a more valid yardstick of popular sentiment and of faith in the existing partnership. Among these are: mental health, neurological diseases, blindness, cancer, heart disease, arthritis, rheumatism, dental health, rehabilitation, school health services, medical care, medical education, emergency maternity and infant care, and disability insurance. Additional sums may be expected for medical and other types of research through the newly created National Science Foundation. The Senate recently passed a bill for the extension and improvement of local health organizations, and it is now under discussion in the House of Represen-

tatives. Federal aid for the support and expansion of medical schools and those of the allied health professions is under active consideration.

All these signs seem to point to a fundamental change in the basic character of public health needs and responsibilities. They may also portend the beginning of another era of outstanding health improvements. Aware of the achievements of health measures in controlling the diseases which once took such great tolls, the people now fully expect that organized health services will help find the answers to some of their as yet unmet health problems. Our remarkable public health progress in the United States during the past quarter-century coincides with the emergence of the Federal government as a substantial partner with State, local, and private agencies in the common cause. I am confident that this partnership and the spirit of cooperation on which it is based will yield even more abundant harvests in the years to come.

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## Further Studies on the Use of a Combined Antigen—TABTD\*

A. H. SELLERS AND G. D. CALDBICK  
*R.C.A.F. Institute of Aviation Medicine, Toronto*

G. G. WATERS AND M. J. MACQUARRIE  
*Connaught Medical Research Laboratories  
University of Toronto*

THE Royal Canadian Air Force instituted a comprehensive plan of diphtheria immunization early in World War II. This action was taken following an outbreak of diphtheria in 1941 at a large R.C.A.F. Station in Canada and the finding that one-half of the service population was probably susceptible to diphtheria (1, 2, 3). This decision was also influenced by the fact that the risk of exposure to diphtheria in operational theatres was known to be significantly great.

R.C.A.F. experience during World War II effectively demonstrated the value of diphtheria immunization (4). As a result, immunization against diphtheria has been continued in the peacetime service—with a preliminary Schick test followed by two 1-c.c. doses of alum-precipitated diphtheria toxoid.

It is desirable for the services to achieve the greatest possible simplification of their immunization program without sacrificing effectiveness. It would be advantageous, therefore, to have a diphtheria antigen which would serve as a satisfactory immunizing agent and which could be used without a preliminary Schick test. If such an antigen could be combined with those now given routinely (TABT-typhoid-paratyphoid vaccine with tetanus toxoid), the number of immunization parades would be substantially reduced.

### PRELIMINARY STUDIES

With this end in view, a preliminary field trial of a special antigen combining TABT with a small amount of diphtheria toxoid was undertaken in 1948 by the R.C.A.F. in collaboration with the Connaught Medical Research Laboratories.

The antigen used in these preliminary trials was designated as TABTD, and was essentially the standard TABT now used in the Canadian armed services with the addition of 2 Lf per c.c. diphtheria toxoid. It was felt that this could safely be given to all recruits without doing a preliminary skin test for susceptibility to diphtheria or sensitivity to diphtheria toxoid since this is the dose of fluid diphtheria toxoid used for immunization of reactors.

\*From the R.C.A.F. Institute of Aviation Medicine, Toronto, and Connaught Medical Research Laboratories, Toronto.

These studies were carried out in collaboration, by the Connaught Medical Research Laboratories and the medical services of the Canadian Armed Forces, under a grant from the Defence Research Board of Canada.

The details of procedure and the findings of this investigation were reported in 1950 (5).

The results of these preliminary studies suggested that it might be possible to develop a combined antigen which would eliminate the use of the Schick test and two separate injections of diphtheria toxoid from the current R.C.A.F. immunization program and yet afford satisfactory protection against diphtheria.

The finding that 4 of the 23 men with less than .001 unit diphtheria antitoxin per c.c. before the administration of TABTD still had less than .001 unit one month after a reinforcing dose suggested the need for a more highly antigenic diphtheria toxoid material.

The success of the product as a secondary stimulus, the absence of any significant reactions, and the encouraging evidence that a product which meets service requirements may be developed which will provide an adequate primary stimulus as well, warranted further investigation.

It was therefore proposed to extend the study, using a diphtheria antigen of greater potency combined with TABT, to a group of sufficient size to ensure the inclusion of about one hundred persons with less than .001 unit of diphtheria antitoxin per c.c. at the outset. This broader field trial was conducted during 1950 on a tri-service basis.

Extended studies have been made by Dr. P. J. Moloney and his colleagues in the Connaught Medical Research Laboratories for the purpose of obtaining diphtheria and tetanus toxoids as free as possible from associated proteins (6, 6a). In this work a number of methods which may be applied to the purification of toxoids were explored and a method developed for the preparation of highly purified diphtheria and tetanus toxoids suitable for use in humans. This method involves the use of a purified diphtheria toxoid adsorbed on aluminium phosphate.

The diphtheria toxoid before adsorption on aluminium phosphate was purified by a method which yielded an Lf/nitrogen ratio of 0.00055 milligrams of nitrogen per Lf of toxoid, which indicates a purification of better than 80 per cent theoretical. The aluminium phosphate on which the diphtheria toxoid was adsorbed was prepared in a manner analogous to that described by Holt (7).

There were certain possible advantages which diphtheria toxoid-aluminium phosphate might possess, namely: lessened tendency to produce reactions in individuals sensitive to diphtheria protein, both because the toxoid is purified and hence contains very little bacterial protein, and because the toxoid has been rendered insoluble by adsorption on aluminium phosphate; and enhanced antigenicity of the adsorbed toxoid as compared with fluid toxoid.

#### FURTHER FIELD TRIALS

In view of the encouraging results obtained in the preliminary studies, further studies on a tri-service basis were undertaken using a combined antigen—TABTD—prepared by mixing purified diphtheria toxoid adsorbed on aluminium phosphate with typhoid vaccine—tetanus toxoid (TABT) in such an amount that the concentration of diphtheria toxoid was 4 Lf per c.c.



of the mixture (TABTD). It is to be noted that this Lf volume is double that used in the preliminary trials.

Each c.c. of the combined antigen (TABTD) which was used in the trial contained the following:

<i>S. typhosus</i> .....	750 million
<i>S. paratyphosus</i> A. ....	250 "
<i>S. paratyphosus</i> B. ....	250 "
Tetanus toxoid.....	8 Lf
Diphtheria toxoid.....	4 Lf

The dosage of TABTD used was the same as that regularly used for TABT, namely, three injections of 1 c.c. each with an interval of one month between injections. A recall dose of 1.0 c.c. was to be given one year after the first dose.

In order to assess the antigenicity of the diphtheria toxoid in the new antigen, blood samples of approximately 5 c.c. were drawn before a first dose of TABTD and a careful history of previous diphtheria toxoid administration taken. Diphtheria antitoxin titrations were done for those with a negative or probable negative history of diphtheria or of immunization with diphtheria toxoid. The objective was to secure approximately 100 men with initial diphtheria antitoxin levels of less than .001 unit per c.c. of serum. Only those men with less than .001 unit per c.c. at the first bleeding were used in the study; on these men, additional diphtheria antitoxin titrations were done: (a) one month after the first dose, and (b) one month after the third dose. A record was kept of all reactions.

All blood samples were sent as quickly as possible to the Connaught Medical Research Laboratories, Toronto, where the diphtheria antitoxin titrations were carried out and recorded.

Blood was drawn from 348 men who received a first dose of 1.0 c.c. of TABTD. Of these 348 men, 253 had a serum-diphtheria antitoxin level of  $> 0.001$  unit per c.c. before receiving toxoid and 95 men showed no immunity to diphtheria ( $< .001$  unit per c.c.). These 95 men formed the basis for the trial of the antigen.

### Results

The results obtained in the follow-up of these 95 men are given in Table I.

TABLE I  
SUBSEQUENT DIPHTHERIA ANTITOXIN LEVELS  
(Men with originally less than 0.001 unit per c.c.)

Antitoxin Level Units per c.c.	Level Before TABTD	1 month after 1 dose TABTD (89 of 95 titrated)	1 month after 3 doses TABTD (86 of 89 titrated)
$> 0.001$	0	48	84
$< 0.001$	95	41	2
Unknown*	—	6	9
TOTAL	95	95	95

\*Lost due to remote postings or discharge.

Blood samples were received from 89 of these 95 men one month after the first dose. Forty-eight of these 89 men showed a response to one dose of TABTD as judged by the appearance of diphtheria antitoxin; forty-one men failed to respond, i.e. had less than .001 unit per c.c.

Third blood samples taken one month after the third injection were received for 86 of the 89 men who did not respond after the first dose of TABTD. Eighty-four of these showed diphtheria antitoxin > .001 unit per c.c. Only two men did not respond.

The antitoxin levels of the 84 men with > .001 unit per c.c. one month after the third dose were distributed as follows:

13	> .001	< .01
18	> .01	< .1
53	> .1	

These results compare favourably with data relating to children who had received three doses of fluid diphtheria toxoid (8). In this case the children received many times the amount of diphtheria toxoid given the men relative to body weight (fluid toxoid 20 Lf per c.c., special antigen 4 Lf per c.c.) (Table II).

TABLE II  
COMPARISON OF 3 DOSES OF FLUID TOXOID WITH 3 DOSES OF TABTD

3 doses of fluid toxoid (20 Lf/c.c.)		3 doses of TABTD (4 Lf/c.c.)	
Antitoxin Level Units per c.c.	Per cent with Stated Level	Antitoxin Level Units per c.c.	Per cent with Stated Level or Greater
> 1/250	93	> 1/1000	98
> 1/50	82	> 1/100	83
> 1/10	42	> 1/10	62

These findings are satisfactory evidence that the special combined antigen used in the study produced a diphtheria antitoxin response which was as good as that obtained among children with three doses of fluid diphtheria toxoid.

### Reactions

Because the diphtheria toxoid—aluminium phosphate is injected along with TABT, it is impossible to make observations on the reaction-inducing properties of the diphtheria antigen in the TABTD. There were no reactions from the combined antigens requiring admission to hospital and none to which specific attention had been drawn or which occasioned any concern. There were sore arms occasionally, of course, but this experience was in no way different from that which had been experienced with TABT alone.

The fact that there were no reactions of significance in 348 men who received special diphtheria toxoid incorporated in TABTD would certainly indicate that the diphtheria antigen possessed a low capacity for inducing reactions. However, it is highly probable that among large numbers of men

injected with the type of TABTD used in this study, some will be encountered who will exhibit reactions typical of diphtheria antigen (6).

### DISCUSSION

In view of the evidence of the satisfactory antigenicity of the diphtheria component of TABTD found in these trials, it was recommended that the material used in this study be adopted for general use in the Canadian military forces to replace the Schick test, alum-precipitated diphtheria toxoid, and TABT. This procedure will eliminate the Schick test and two diphtheria toxoid inoculations. This recommendation was approved on a tri-service basis and the new product TABTD, prepared as used in this study, was introduced in June, 1951, for use in the immunization of personnel of the Canadian Armed Forces.

The successful application of a combined antigen such as the one for which the trials have recently been completed is of great administrative importance to the armed services. Besides effecting a substantial economy, it will reduce from 6 to 3 the number of injections to be received by a new recruit during his first two months in the service. More important still, it would seem reasonable to expect that the material developed may have a wide civilian defence application.

### SUMMARY

1. The need for continuing the diphtheria immunization program in the R.C.A.F. was established by the experience gained during the war years.
2. The necessity for simplifying the technique of administration led to the idea of developing a special combined antigen in which a small dose of diphtheria toxoid is combined with TABT.
3. A preliminary study conducted by the R.C.A.F. in collaboration with the Connaught Medical Research Laboratories to determine the efficiency of a special combined antigen (TABTD) met with encouraging results.
4. The preliminary studies were extended on a tri-service basis, to a larger group, using a purified diphtheria antigen of greater potency adsorbed on aluminium phosphate.
5. The new product proved effective both as a primary and a secondary stimulus and gave a diphtheria antitoxin response as good as three doses of plain toxoid.
6. No significant reactions were experienced throughout the investigation.
7. The new product was recommended for use in the Canadian Armed Forces and was introduced in June, 1951.

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Coming Meetings**Alberta Public  
Health Association****Edmonton****September 4 and 5****Ontario Public  
Health Association****Toronto****October 1 and 2**

## Letter from Great Britain

# The Medical Officer of Health in Great Britain (V)

## THE CARE OF THE AGED

FRASER BROCKINGTON

M.R.C.S.(Eng.); L.R.C.P.(Lond.); D.P.H.; B.Chir., M.D.(Camb.);

M.A.(Camb.); Barrister-at-Law

*County Medical Officer*

*Public Health Department, West Riding of Yorkshire*

*Wakefield, Yorkshire, England*

ENGLAND has grown old suddenly; when Public Health began a hundred years ago our country died young. English literature of later Georgian and early Victorian days abounds in references to the death of characters we should now regard as in middle age. Old age has come upon us too suddenly to have been adequately studied as a problem in social medicine. The expectation of life has advanced twenty years during the lifetime of persons living today. The suddenness of the change has been reflected in the attitude of the medical profession. The curative branch of medicine has continued to be absorbed in the problems of acute sickness to the almost total neglect of chronic illness; rarely, for example, has the good general hospital admitted chronic cases. Medical and nursing staff have tended to look down upon the work of dealing with the chronic patient; in consequence he continued into the first half of the twentieth century to find his only succour in the Poor Law, receiving attention more in keeping with the first half of the nineteenth century with, in particular, medical and nursing standards on a much lower level. The preventive branch of medicine has been equally absorbed in other problems such as the environment and the young family; moreover, the health department was for nearly a century virtually excluded from the work of the Poor Law. These attitudes are now rapidly changing under the impact of two big administrative reforms, the unification of the hospital system under one management (National Health Service Act, 1946) coupled with the breakup of the Poor Law (National Assistance Act, 1948).

How old is this nation? In the England and Wales census of 1851 (population 12 millions) there were just over three-quarters of a million persons (4.6 per cent) over 65 years of age; the figure for 1950 (population 44 millions) was just under 5 millions (11 per cent). In the next forty years this total of aged people may rise to 8 millions (16 per cent) in a static or declining population. An indication of the rate at which ageing is taking place is given by the following West Riding of Yorkshire figures: in the 1931 census 65 persons in every 1,000 were over 65 years of age; the computed figure for 1947 was 105.



Thus, in the last twenty years the number of aged persons has nearly doubled. One in ten, or more, are now aged. It is true that we must revise our ideas of what is 'old age' and there are indications that this is already in process; University professors can in some instances remain in office to 67 years of age and the Chancellor of the Exchequer in his latest budget is operating reliefs to encourage old-age pensioners to continue in work. Yet the fact remains that we are old and getting older fast. Down every street one family in two has an old person in its midst; many live alone in great loneliness and discomfort. This is one of the great sociological problems of our history, thrown into sharp relief by the decline in the number of young folk who must bear the burden. In the 1851 census there were just over 6 (35.4 per cent) million children (under 15 years); today there are just under 10 (21.9 per cent) million children in a population nearly three times as great. More than one-third of the men and women of working age in Britain are today over 40 years of age and by the turn of the century this may be as much as half. We have here a problem of considerable extent and complexity. Unless there is a steady and marked improvement in health and physique, much of the benefit normally derived from medical progress will be dissipated; instead of increasing output per head we shall succumb to a decline in physical energy.

The promotion of health in the aged is, therefore, of paramount importance in Great Britain as in many other countries today. *Eugeria* is a business as well as a moral proposition. It must pay to keep the aged out of hospitals and old folk's homes, which are so costly in money and skilled attention; some (no doubt an increasing number now with the Chancellor of the Exchequer's latest reliefs) will continue to work and so add their quota to the country's wealth; others will play an active part in running the household in which they live, particularly in caring for invalid children, grand-children and other, often aged, relatives. If community health is looked at as a moral or aesthetic asset, then it is well to remember the lasting contributions which many have given in their so-called declining years; Daniel Defoe and Voltaire would, for example, have been unknown men today had they died before the age of sixty years. How different might the world have been had Bernard Shaw died 35 years earlier.

The problem of the aged is fundamentally one of health. The incidence of acute and chronic sickness is much higher among the aged than in the lower age groups and it is this which produces most of the difficulties. One third of all old people fall ill every year and need the services of a doctor and the number of such home visits runs at twice the rate for younger ages. The incidence of degenerative diseases in those over 65 years of age is 84 per 1,000. In the Wolverhampton survey (Sheldon, *The Social Medicine of Old Age*, 1948) nearly a third had some constitutional disturbance; 14 per cent had difficulty in ascending the stairs and 2.5 per cent were bedfast. Scurvy, which has disappeared in the young, has re-appeared in the old, and some aged now admitted to mental hospitals are suffering from extreme deficiency of vitamin B<sub>1</sub>; is there any wonder when we see how small is the single ration without the extras to be obtained in canteens and elsewhere and unswollen by the pooling of family resources? The relationship of age and health is so close that an ageing nation is bound to look to the health department for a lead in formulating schemes and for general direction.

What then can medicine offer in the solution of this relatively new problem? What is needed is a combined operation bringing in both the preventive and the curative sides of medicine. The first task of the curative side is to reorganize the treatment of the chronic sick. The strictures upon the character of the chronic-sick institutions under the Poor Law have no doubt been exaggerated and in any event it is easy to be wise after the event. McEwan and Lavery (The Chronic Sick and Elderly in Hospital, 1949) say:

"The 701 patients who have been examined and classified are, nearly all of them, the final result of the hospital system of the past which is now, it is to be hoped, nearly at an end. They are decrepit in mind and body. Their mental activities have decayed and they are dull, listless and apathetic. Their joints are often stiff and painful, and their muscles weak. Everyone, themselves included, has regarded them as hopeless and useless, and that is just what they have become. This group has in actual fact furnished us with many useful lessons of 'what not to do'. Even for these patients, as they are today, much can be done. The old atmosphere of gloom and apathy can be changed and their outlook made brighter and happier, and many can enjoy getting about again, but the cure ratio must be small. The chief aim of a geriatric service must be to keep the elderly in the future from falling into this hopeless state, and it is certain that much can be achieved."

This state of affairs is now being remedied by the inclusion of the chronic sick within the general hospitals system and by providing a full range of diagnostic, therapeutic and rehabilitative skill. In some instances as many as half of the patients of chronic sick wards have been improved sufficiently to go home or to hostels. Nevertheless, the Repeal of the Poor Law has not been an unmixed blessing for the increasing numbers of chronic sick, for it has removed the absolute right to admission even when this went hand in hand with overcrowding and a low-grade service. The increasing need has also coincided with a tendency to reduce accommodation for the chronic sick as an outcome of improvements in arrangements for the acute sick. This is a subject of concern to the preservation of community health which calls for the closest scrutiny. There is no clear dividing line between infirmity and chronic sickness and many chronic sick are not in need of full hospital care. Among much else, consideration should be given to the expedient of making the community health authority responsible for providing accommodation of a hostel character for those chronic sick not in need of full hospital care—a parallel form of institution to the old folk's home.

The admission of sick aged to hospital needs to be done more scientifically as a partnership between the hospital and the health department. Except in the case of acute illness, when immediate admission is necessary, there should be a close study of the background picture to determine the need for hospital care and to establish the obligation of the relatives. This may have the effect of securing adequate home care without admission to hospital and it can secure the admission of cases in order of priority in relation to the home background. The discharge of cases can be organized along the same lines. An instance of such work is the arrangement which has been conducted during the past year in connection with a former Poor Law institution (112 beds) in the West Riding. A health visitor from the divisional health office of the area in which the hospital lies has been

appointed (in agreement with the local hospital management committee) to undertake the work. When a general practitioner asks the hospital to admit a patient, the hospital health visitor first undertakes a social enquiry; when the hospital physician considers a patient fit for discharge, she again tackles the home to try and bring about the desired result. Thus, in the first five months 103 cases were notified for admission; 91 home visits were paid in connection with these applications; 58 cases were admitted; 10 went to other homes; 25 patients were discharged to their own homes and placed in charge of relatives; 14 patients were furnished with home helps; 13 with a home nurse; 6 were referred to the local welfare officer, and 5 to the local health visitor for further supervision. In her report on the new venture Miss X says:

"When I undertook these new duties, I was of the opinion that they would well combine with my other work and proposed to allocate two half days per week for this purpose. As will be appreciated, the work has grown much more than was originally envisaged and I now find it occupies four or five half days, according to the number of cases notified. In addition, I find it necessary to be in touch with the hospital daily, and also co-operation and consultation has to be given at all hours to general practitioners to ensure that, in the present shortage of accommodation, the most urgent cases are dealt with as soon as possible. Overcoming the opposition of relatives takes considerably more time than was anticipated. They are under the impression that the aged, once they are in hospital, will be there for the remainder of their days and considerable tact and firmness are needed. In some cases I have considered it essential to obtain a written statement from the relatives to the effect that they are willing to have the patients home when the doctor declares them fit for discharge."

I have gone into this aspect of the care of the aged in some detail because it presents an excellent example of the development of social medicine which this problem so clearly needs.

Nevertheless it is health in the home rather than in the hospital which is the main issue. According to Sheldon all but 2 per cent of aged persons live at home (and only 1 per cent are in hospital); of the sick aged only 5 per cent reach hospital. What is needed to meet this situation is a combination of preventive and therapeutic measures with emphasis upon the former. This, it has been said, "is a typical example of social medicine and requires the administration of doctors who can see all its facets and are sufficiently interested and experienced to persuade others to do their share". As Professor Crew has declared, "The medical officer of health must find here one of his greatest opportunities". One of the important functions of health departments should be that of keeping the aged from falling into such a state that they require institutional care either in hospital or in homes for the aged. There must be attention to personal welfare, health education and the treatment of minor disabilities. Some of this calls for visiting at home and some can be done in association with social clubs or community centres. Minor ailments are more irksome to the aged; they reduce an already impaired mobility, prevent participation in community activities and thereby induce loneliness; they can progress more readily to severe disorders because of a diminished power of recuperation. But the work involved requires time and patience; it is often more than can be spared in the overcrowded surgery

and in the busy doctor's round; hospitals are often remote and inaccessible and may also be ill-equipped to render special services to the large numbers of aged with minor disabilities and major socio-medical problems.

The suggestion made in the Poor Law Minority Report (1905-09) that health departments should exercise a general guardianship over the aged is fundamentally sound. They should survey their areas and know where there are aged living in bad conditions and likely to need guidance. Some health departments maintain a register of all aged persons in order to be able to give particular attention to those living in difficulty. The social work involved cannot be separated from that in other health fields; it entails the full use of the health visitor, who can give that same admixture of health teaching and concern for social factors which constitutes her work for other priority classes. The aged can provide a valuable extension of health visiting. The work must, of course, be supplemented by visiting through voluntary organizations (such as those under the National Old People's Welfare Committee) to help with shopping, books, letter writing, mending, etc. "Home visiting of this kind has been shown to be of particular value for it can mitigate the sense of isolation and loneliness often experienced by these old people" (M/H Circular 11/50), and it can draw attention to those in need of other services. It is a duty of local authorities to promote the formation of such local voluntary organizations. Under the guidance of the health visitor the home help can do much to alleviate the lot of the aged who are incapacitated and without help from relatives. During the past three years home-helps schemes have been organized throughout Great Britain with surprising success; there seems indeed to be only one limit to expansion, namely, the ability of the health authority to foot the bill. In the West Riding of Yorkshire last year the aged absorbed 268,255 hours out of a total consumption of 708,376 home-help hours; this entailed a cost of £31,300 but it may well have saved many times this sum in hospital charges. Thus, the present service is designed to provide a home nurse for the bedridden, a home help for any who are substantially incapacitated (for housework, laundry and shopping), a health visitor who supervises the case generally and sees to many details including the financial and other benefits to which the aged person is entitled, and voluntary visitors. Add to this the work of the National Assistance Board which visits through officers of its local offices every applicant for financial assistance (812,000 old people are now in receipt of allowances and the Board made five million visits last year). If there is still a gap, this is accounted for by the fact that existing services are not in all cases fully and properly used; some of this is due to the need for economy and some to the slow process of reorientation; health visitors have not yet wholly adjusted themselves to the new duties. It may well be argued that the present service is too extravagant in trained personnel and that the staff and finance will never be available on the scale needed in the future. This is an aspect which will need to be carefully watched, particularly to determine how extensively the voluntary unqualified worker can be used. I believe there is an immense scope for them in this field.

The aged present a fine field for experiment by health departments everywhere. One such experiment is the establishment, in conjunction with social clubs or independently, of centres to advise upon health and socio-medical matters.

It is surprising how many aged folk have problems, the solution of which can be of immense importance to them and indirectly to the community health. Advice on housing, home helps, home nursing, admission to hospital, old folk's homes and convalescent homes, the problem of work and of occupational therapy. In its simplest form a health visitor can attend for half to one hour at the social centre; this can be supplemented by routine medical inspection from a doctor attending on a sessional basis, and by the occasional visit of a geriatric specialist. The services of a chiropodist are invaluable; a high proportion of aged are in varying degree incapacitated by callosities and not a few eventually find themselves in hospital at the end of a long chain of circumstances which began with an uncared-for corn. Physiotherapy can also be a beneficial adjunct but in Britain physiotherapists are in such short supply that they now work almost wholly in relation to hospitals. The occupational therapist can develop the creative element which helps to delay deterioration and provides a personal and social interest so necessary to the ageing; paper, raffia and leather work, working in wool, webbing and felt, bead threading, toys, simple modelling and painting, sewing and weaving, can all find a valuable place, together with the growing of simple things.

The accommodation for the aged and infirm (as distinct from the chronic sick) in the 'House' section of the old workhouses has long been regarded as unsatisfactory. As one of the most persistent attributes of the old Poor Law this continues as 'Part III' accommodation (separated from the sick wards, which have gone to the hospital boards) for which welfare authorities are now responsible. It is, of course, impossible to change the character of this accommodation (or indeed its inmates) overnight. A new type of hostel has, however, come into operation as the old folk's home (under Sec. 21 of the National Assistance Act). Since the war 300 local authority homes have been opened and 300 more are in course of completion (in the West Riding 7 with 141 places) with a standard approximating to a medium-class hotel. The inmates pay according to their means and not less than 21s.0d. out of the 26s.0d. (raised in the recent budget to 30s.0d.) pension. Such homes (mainly supported out of public funds) can do little more than touch the fringe of the problem. The total places for the aged in the West Riding is 1,535 in former institutions and 141 in new hostels, or 11 places per 1,000 aged. Like the maternity homes, these hostels should be considered as primarily to protect the community health; admission to this accommodation (limited and expensive) should be for cases selected by the Medical Officer of Health on health or sociological grounds.

Thus, in the past three years the approach to the problem of the aged has indeed undergone transformation; on the one hand hospital management committees have, as it were, swept through the old Poor Law institutions, redecorating and equipping; on the other new schemes of care in the community, including many new homes, have grown up with surprising speed. The greatest difficulty to progress lies in the continuing dichotomy between 'health' and 'welfare'. The first circular (70/48) under the National Assistance Act, 1948, discouraged local authorities from placing the new welfare services under the Medical Officer of Health. It is perhaps significant that the Advisory Council for the Welfare of Handicapped Persons (established under the National Assistance Act to advise the Minister of Health) has only one medical man among its 15 members. This



is one of the instances of dichotomy to which social medicine has been so cruelly subjected; the socio-medical services under section 28 of the National Health Service Act, 1946, are separated from the welfare services (under section 29 of the National Assistance Act, 1948). Social welfare in the form of social clubs, the teaching of handicrafts, the organisation of meals schemes (generally on wheels), and voluntary home visiting, can contribute much to eugeria. But unless these 'welfare' schemes are fully integrated with health visiting and home nursing, arrangements for home helps, centres for advising on minor ailments and schemes for studying the social background of the chronic sick seeking admission to, or awaiting discharge from, hospital, there is certain to be overlap and waste of effort. The real answer must lie in placing the new 'welfare' within the department of the Medical Officer of Health with trained welfare officers who can organise the social aspects as a member of the community health team. The Medical Officer of Health should be responsible for a co-ordinated scheme of social medicine and social welfare for the aged as a group of susceptibles whose health and welfare are vital to the health of the community.

# The Estimation of Hospital Bed Requirements

C. B. STEWART, M.D., M.P.H.

*Professor of Epidemiology, Dalhousie University,  
and Director of the Health Survey  
Nova Scotia Department of Public Health*

ANYONE who has been concerned with the planning of hospital facilities, whether it be for a town, a county, a province or a country, realizes the need for sound estimates of the bed requirements in order to answer questions of this type. How many hospital beds are needed in Canada today? How many would be required if we had a system of compulsory hospital insurance? Does Extown need a new general hospital of 200 beds or would 150 be sufficient?

Various methods have been used to obtain such estimates. Hospital administrators and directors of hospital programs have long been acquainted with them, and indeed have been largely responsible for their development. Today the public health officer is also showing more interest in the use of health statistics to estimate the community resources required for diagnostic and treatment services, as well as those for preventive programs. When compulsory hospital insurance is being introduced or planned in several provinces, when government-financed hospital services are being provided for tuberculosis, mental illness and other specific diseases or groups of conditions, and when Federal Health Grants are available to aid in hospital construction, any assistance in estimating hospital bed requirements would seem desirable. On the other hand, some caution must be exercised. Estimates that are based on misconceptions or on a too-ready acceptance of unproven hypotheses may give a false sense of assurance. The effect of a local condition or a recent trend may be so powerful that conventional methods of estimating hospital requirements or the application of accepted standards may prove dangerously misleading.

It is the intention of this paper to review some of the standard methods which were used to estimate hospital requirements during the Federal-Provincial "Survey of Health Facilities" in the province of Nova Scotia. Some of the advantages and defects of these methods will be discussed, as well as several modifications that were introduced. It is intended primarily to demonstrate how misleading these calculations may be in planning facilities to care for the demand under a hospital insurance program.

Methods for calculating the number of hospital beds may be classified into three main groups:

- (1) Estimates based solely on population. It has been recommended, for

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example, that 4.5 or 5 general hospital beds should be provided per thousand population.

- (2) Estimates based on birth and death statistics and on previous experience in hospital usage in the region. One such determination is that based on the bed-death ratio, which will be discussed in a later section. Another common one is the standard method of providing 2.5 or 3 beds per tuberculosis death. Such estimates are based on an assumption that there is a constant relation between the number of deaths and the number of patients requiring treatment in hospital.
- (3) Estimates based on morbidity surveys with an evaluation of unmet needs for hospital care, or based on the volume of hospital services in areas which have had a complete hospital insurance plan in operation long enough that the demands have stabilized or give indication of levelling off.

In making use of these methods an important question immediately arises. How far is one justified in adopting in Canada the standards that have for the most part been established in the United States? True, our countries and people have many similarities. There are no major differences, particularly between Canada and the northern states, with respect to age distribution, racial composition, incidence of preventable diseases, economic status and other medical and sociological features that are usually taken into account. However, at least two important factors that have a profound influence on general hospital needs, may differ widely from one region to another:

- (1) The availability of other forms of institutional or medical care, such as hospitals for the chronically ill, nursing homes, convalescent hospitals and out-patient clinics.

- (2) The attitude or habits of people with respect to hospital care.

It would appear that general hospitals in some provinces of Canada, such as Nova Scotia, bear a heavier load than in the U.S.A. This is at least partly because of the lack of hospitals for the chronically ill and the other institutions or services mentioned above. Most American experts recommend a specified number of beds (usually 4.5 or 5) per thousand for the general hospitals, and an additional number (usually 1 or 2) per thousand for chronic disease hospitals, and still other specified numbers for tuberculosis, acute communicable diseases and mental illness. Since there are no hospitals for the chronically ill in Nova Scotia, some of their functions are taken over by the existing general hospitals. One might, therefore, have to estimate general hospital requirements at a higher level than the American standards, perhaps as high as seven beds per thousand, unless a whole new group of institutions for the chronically ill were developed. The latter procedure might be desirable. In any event a decision would have to be made on it before the American standards could be applied without modification.

The attitude toward hospital care during illness is perhaps even more important. This has changed tremendously in recent years both in Canada and the United States, but there are evidences that the trend is not an even one and some regions now differ widely from others. We are not far removed from the days when hospitals were looked upon with horror and repugnance as "death houses". In a recent eulogy on a prominent Canadian doctor one of his confreres com-

mented on the surgeon's skill in persuading patients to go to hospital for treatment in the early days of modern surgery. In some regions the day seems to be fast approaching when equal skill will be required of the physician and surgeon to persuade people to stay out of the hospital! In others, the old-fashioned fear of this institution has not yet disappeared. It is difficult to evaluate the difference between the Canadian and American people in this respect, and even between peoples of various areas in each country. Indeed, there are wide differences from one region to another within the province of Nova Scotia in respect to the utilization of available hospital facilities. The customs regarding hospital usage cannot therefore be left out of consideration in calculating the hospital requirements of any region. At least some index of the past experience and of the trends in the region are desirable, and the use of a standard worked out in another area may be misleading.

A brief review of the general hospital facilities of the Province of Nova Scotia in 1948 is desirable before presenting an estimate of future needs. The province can be divided readily into nine regions. Geographic features, transportation and other factors make these regions fairly distinct entities. The location of existing general hospitals is reasonably good. There are few areas where a person is more than 25 miles from a hospital. There is a shortage of beds, but not of hospitals. It might be preferable in some areas if there were fewer and larger institutions. Table I shows the estimated population for each region in 1948 and the bed capacity of the general hospitals.

TABLE I  
BED CAPACITY BY HOSPITAL REGION IN NOVA SCOTIA PER 1,000 POPULATION,  
DECEMBER 31, 1948

Hospital Region	Estimated 1948 Population	1948 Bed Capacity	Capacity per 1,000
1	140,915	786 (1)	5.6
2	47,710	49	1.0
3	58,546	109	1.9
4	66,551	163	2.4
5	43,780	57	1.3
6	42,418	122	2.9
7	42,801	146	3.4
8	26,833	128	4.8
9	165,446	619	3.7
Nova Scotia	635,000	2,179 (1)	3.4

(1) Excluding D.V.A. and Defence Department Hospitals.

There was considerable difference in bed capacity from region to region. Most were well below the lowest recommended standard of 4.5 beds per thousand. The provincial average was 3.4 beds per thousand. The complement was 2,614 beds or 20 per cent higher than the uncrowded capacity.

In calculating the needs for general hospital beds in Nova Scotia, comparison was first made between two estimates based on providing 5 beds or 6 beds per thousand population, and one based on maternity bed requirements and the bed-death ratio. These represent the first two methods of calculation, described above.

It is easy to calculate the number of beds required by a certain population if an arbitrary standard is applied. However, it is also obvious that all of these beds need not be located within the geographic borders of the region. Some patients

are referred to the provincial or base hospitals. Some prefer to enter hospitals in other regions. Several methods have been suggested for reallocating a proportion of the beds to the regional and base hospitals. In the Oklahoma survey of 1945 (5), it was recommended that 4.5 beds per thousand be located in a county with a major medical centre and an additional 0.5 beds per 1,000 in other counties within that hospital district. An intermediate county had 3.5 beds per 1,000 for its population and an additional 0.5 beds for the population of other counties in that hospital district. Smaller counties had a basic ratio of 2.5 beds per 1,000.

Experience in Nova Scotia indicated that regional hospitals did not receive many patients from the community or district hospitals. Most "problem cases" were referred directly to the provincial centre at Halifax. It was therefore decided not to employ any arbitrary standards, but to reallocate the beds in each region according to actual experience. A review of the data on admissions indicated that all hospitals had been receiving patients from the same areas in almost exactly the same proportions for several years. The total 1948 patient-load of each hospital was therefore classified by county of residence. By combining the data for the whole province it was possible to determine accurately which hospitals were used by the population of any county and in what proportion. For example, County A with a population of 19,000 would require 95 beds, if a standard of 5 per thousand were adopted. Of 1,511 residents of that county treated in hospital in 1948, 689 had gone to Hospital A, 422 to Hospital B, etc. Beds were alloted accordingly. Twenty-five per cent of them were in hospitals outside that county, including about 10 per cent in the provincial centre at Halifax. However, fringe areas from adjacent counties also sent patients into hospitals located in County A. This was taken into account by the method of calculation, since some of the hospital beds of County B and County C were allocated to hospitals in County A.

Table II shows how the number of beds required by the population of each region in a standard of 5 or 6 per 1,000 were provided and how these beds were re-allocated according to the pattern of patient-distribution in 1948.

The third column of each section shows the ratio of beds per thousand population located within each region. The provincial or base hospital is located in Region 1, and this area would gain beds in the re-allocation. In some others the loss was almost balanced by gain from fringe areas of the adjacent regions.

Although this method also provides an estimate of how the beds could be allocated by hospitals within each region, it is doubted whether such estimates should be used in planning construction. It is hoped that regional hospitals may increase in importance as their facilities improve and it is believed that most of the new hospital beds should go to larger regional centres. However, the total estimate for each region re-allocated by this method gives a more realistic evaluation of the needs than an arbitrary allotment of beds based on the assumption that a constant proportion of patients in each area are referred to regional and base hospitals. One criticism might be that the construction of new hospitals in areas which previously had none would greatly change the patient-distribution among the hospitals. This would undoubtedly have an effect within each region, but would not have much influence on neighboring regions in Nova Scotia, since each is a relatively distinct geographic unit.

The estimates shown in Table II are based on the 1948 population and may be said to give some indication of the immediate needs. In planning construction it would seem desirable to build sufficient hospital facilities for at least ten years and preferably longer. In a later table (No. VIII) requirements are shown that were based on the 1961 estimated population.

TABLE II  
ESTIMATED BED REQUIREMENTS WITH REGIONAL RE-ALLOCATION  
BASED ON RESIDENCE OF PATIENTS ADMITTED IN 1948

Hospital	5 Beds per Thousand			6 Beds per Thousand		
	Beds for Regional Population	Beds Located in Region	Per Thousand in Region	Beds for Regional Population	Beds Located in Region	Per Thousand in Region
1	705	939	6.6	845	1,128	8.0
2	238	154	3.2	286	186	3.9
3	293	284	4.9	352	340	5.8
4	333	324	5.0	400	386	5.8
5	219	159	3.6	263	193	4.4
6	212	195	4.4	254	234	5.5
7	214	200	4.7	257	239	5.6
8	134	137	5.1	161	165	6.1
9	827	783	4.7	992	939	5.7
Nova Scotia	3,175	3,175	5.0	3,810	3,810	6.0

For comparison with these two estimates of 5 or 6 beds per thousand another estimate was made, based on maternity bed requirements and the bed-death ratio. Maternity bed requirements may be calculated from the following data:

- (1) The expected number of births in future years.
- (2) The proportion of births likely to occur in hospitals.
- (3) The average hospital stay per patient.
- (4) The bed-occupancy ratio.

For example, if the average stay in hospital of obstetrical patients is 8 days, each 1,000 births would require 8,000 patient-days. This is equal to 8,000/365, or 21.9 patient-years. It would require 21.9 beds, occupied all of the year, to care for 1,000 maternity patients. The bed-occupancy ratio is largely dependent on the size of the unit. If there was an average of 60 per cent occupancy, a total of 36.5 beds would be needed to allow 21.9 to be occupied at all times.

In this calculation of maternity bed requirements in Nova Scotia the average annual number of births per hospital region for the five-year period 1944 to 1948 was used, with allowance for an increase in population. It is recognized that a change in the birth rate might also affect this calculation. If the population increased at the same rate as in the preceding ten years and the birth rate remained constant, the 1944-48 average number of births would be increased approximately 10 per cent by 1960.

Table III shows the proportion of births occurring in hospitals in Nova Scotia from 1925 to 1950. In 1948 there was no indication that it was likely to level off much below 100 per cent, but the 1949 and 1950 figures indicate that the

trend is slowing down. Fitting of a logistic curve indicates the likelihood that it will level off between 95 and 100 per cent. This trend has had a tremendous effect on the hospital requirements, and it is still being given too little attention in the planning of general hospitals, and particularly in remodelling old ones. The day is past when a nursery can be improvised in an old linen cupboard or when a few beds in the general wards or private rooms can be assigned for obstetrics.

TABLE III

PROPORTION OF TOTAL BIRTHS OCCURRING IN HOSPITALS IN NOVA SCOTIA, 1925 TO 1950

Year	Total Births	Births in Hospital	Per cent in Hospital
1925	11,400	1,194	10.5
1930	11,346	2,280	20.1
1935	11,617	3,270	28.1
1940	12,856	5,753	44.7
1945	15,527	11,589	74.6
1948	17,791	14,153	79.6
1949	17,761	14,588	82.1
1950	17,412	14,331	82.3

A further analysis of these data showed considerable variation from region to region in the proportion of births occurring in hospitals. There was a range from 45 to 93 per cent. As might be expected, the regions which were inadequately supplied with hospital beds had a lower proportion of births in hospital. The hospitals were too crowded to admit uncomplicated obstetrical cases. One of these regions showed an increase from 45 per cent in 1948 to 62 per cent in 1950 after the opening of a new fifty-bed hospital in a county that had previously had none. It is assumed that this trend will continue in all areas and will be accelerated as the hospital facilities increase. Estimates of future bed requirements should therefore be based on 95 to 100 per cent hospitalization for obstetrics. It might be interesting to note that this trend has not developed in Nova Scotia as a result of a lack of home-nursing services. The Victorian Order of Nurses has a more complete coverage in this province than in any other.

The third factor to be considered is the duration of hospital care for maternity cases. It is well-known that there has been a modern trend toward early ambulation and discharge of obstetrical patients, but it is important to note that the acceptance of this modern philosophy of treatment has varied a great deal. Not all obstetricians and general practitioners who do obstetrics have followed the modern trend. The average duration of hospital stay of all obstetrical patients in 35 hospitals during 1948 ranged from 5 to 10.9 days per hospital per year. The average stay for all hospitals was 7.6 days and the median was 7.3 days. One hospital, which kept obstetrical patients for an average of 10.1 days, was in an area that was well provided with hospital facilities. There would have been no serious pressure in this hospital to release beds by early discharge. However, two others with an average stay of 9.7 and 10.0 days were among the most overcrowded hospitals in the province. The custom of the obstetrician would seem to take precedence over the availability of beds, or possibly the longer stay in these



institutions reflected the necessity of admitting only the severe or complicated cases.

In view of the trend toward shorter hospitalization, it was decided to use the median of 7.3 days, rather than the average of 7.6 days, in the calculation of bed requirements in Nova Scotia. This may still give a slight over-estimate of bed requirements, if the trend toward shorter hospitalization continues.

Finally, the bed occupancy ratio depends largely on the size of the hospital unit. Table IV shows the per cent occupancy of general hospitals in 1948, based on their actual bed complement rather than the uncrowded capacity. A comparison is made of the provincial figures with those reported by the U.S. Public Health Service (2).

TABLE IV  
BED OCCUPANCY RATIO OF N.S. HOSPITALS  
GROUPED ACCORDING TO BED COMPLEMENT

Bed Complement	Number of Hospitals	Total Bed Complement	Per cent Occupancy in Nova Scotia	Standard per cent Occupancy
Under 20	10	121	43.7	40.0
20-49	16	664	67.9	64.0
50-99	5	388	78.6	68.3
100-299	5	797	77.4	77.7
300 and over	1	425	80.8	84.0
	37	2,395	73.6	

Maternity units are, or should be, segregated from the rest of a general hospital. Such a unit must therefore be considered almost as if it were a separate institution. A twenty-bed maternity unit in a 100-bed hospital will be nearer to the 40 per cent occupancy of a twenty-bed hospital than the 78 per cent of a 100-bed institution.

To summarize, the maternity bed requirements as of 1960 were calculated from the regional average annual number of births between 1944 and 1948 increased 10 per cent, 95 per cent of births to occur in hospitals, 7.3 days of care per obstetrical patient, and bed-occupancy ratios based on the approximate size of the maternity units rather than the hospital size.

As a result of these calculations it was estimated that 639 maternity beds would be needed in the province. The bed capacity of existing units was 432, but the complement (crowded capacity) was 519 in 1948.

To this requirement was added the need for the acutely ill, calculated from the bed-death ratio. It is reported that in the U.S.A. there is a very stable relationship between total days of care in general hospitals and the number of deaths occurring in these hospitals (1). An average of 250 days of care are given for every death that occurs among the patients. The figure is said to be very similar from state to state. If this ratio were applicable in Nova Scotia, one could simply calculate total patient-days and total bed requirement from the expected mortality statistics and the proportion of all deaths which occur in hospital. However, there is some doubt whether the Canadian experience in this respect is the same as that of the U.S.A.

Table V shows the average period of hospital care per death in Nova Scotia general hospitals between 1925 and 1948, or the ratio of patient-days to hospital deaths.

TABLE V  
RATIO OF PATIENT-DAYS TO HOSPITAL DEATHS IN  
GENERAL HOSPITALS OF NOVA SCOTIA, 1925 TO 1948

Year	Total Patient-Days	Deaths in General Hospitals	Average Days Care per Death
1925	261,421	662	394.9
1930	336,471	977	344.4
1935	392,494	1,152	340.7
1940	454,894	1,318	345.1
1944	543,443	1,663	326.8
1945	567,952	1,654	347.0
1946	600,260	1,522	394.3
1947	602,078	1,593	378.0
1948	647,996	1,675	386.9

All figures were well above the U.S. average of 250 days. In the five years 1944 to 1948 the average in Nova Scotia was 366 days of care per hospital death. There was considerable variation around this average, but on the whole the ratio was relatively stable from year to year. However, Table VI shows that this ratio varied widely from one hospital region to another.

TABLE VI  
AVERAGE PERIOD OF HOSPITAL CARE PER DEATH  
BY HOSPITAL REGION, 1948

Region	Total Patient Days	Deaths in Hospital	Average Days per Death	Bed Capacity per 1000	Per cent of Region's Deaths Occurring in Hospital
1	260,129	455	571.7	5.6	35.2
2	13,156	46	286.0	1.0	9.3
3	31,640	124	264.9	1.9	20.4
4	43,576	175	246.1	2.4	26.1
5	24,446	67	364.9	1.3	17.4
6	30,127	98	307.4	2.9	24.1
7	44,083	150	293.9	3.4	31.5
8	48,063	106	453.4	4.8	35.9
9	217,182	557	389.9	3.7	38.4
Nova Scotia	696,510	1,778	391.7	3.4	29.2

There appears to be some relation to the adequacy of hospital facilities, although this is not clear-cut. Four regions with 3.4 or more beds per 1,000 population had more than 30 per cent of the total deaths occur in hospital, and they also provided the highest average number of days of care per death. However, the regions with fewer hospital beds showed no consistent relation between average days of care per death and the number of hospital beds available. It would seem that the custom of the people with regard to hospital usage, or some

other variable such as age distribution, may play a part. In any event, the differences between regions are very striking, ranging from 246 to 453 days in the eight regions outside the Halifax area, and reaching 572 in that region, which contains the provincial referral centres.

It is obvious that this ratio of patient-days to hospital deaths, which is said to be so consistent from state to state in the U.S.A., is singularly inconsistent from region to region in Nova Scotia and yet almost always higher than the American figure. This may be an indication that our general hospitals have taken on some of the duties of the chronic disease hospital. The longer stay per fatality might be due to a higher proportion of chronically ill, long-staying patients. In any event, it is obvious that the U.S. standard of 250 days per death cannot be used, and the wide fluctuation from region to region in the province itself suggests the inadvisability of using even the provincial average. It is interesting to note in Table VII that the fluctuations within any single region from year to year were not so large as the differences between regions although they were still fairly large. It was therefore decided to use the regional five-year average of days of care per death in the estimation of bed requirements.

TABLE VII  
RATIO OF PATIENT DAYS TO HOSPITAL DEATHS  
BY REGION, 1944-48

Region	1944	1945	1946	1947	1948	Mean
1	356.4	334.0	458.9	459.7	578.8*	437.6
2	278.1	255.4	201.5	208.7	286.0	245.9
3	209.8	282.6	380.4	314.2	264.9	290.4
4	281.8	303.7	333.9	252.4	246.1	283.6
5	263.1	282.6	278.8	422.0	364.9	322.3
6	352.7	300.1	367.9	343.0	307.4	334.2
7	308.6	353.2	323.7	305.9	293.9	317.1
8	451.9	461.7	498.8	468.5	453.4	466.9
9	336.9	377.3	423.9	407.4	389.9	387.1
Nova Scotia	326.8	347.0	394.3	378.0	386.9	336.0

\*The difference between the figures for Region I in Tables VI and VII result from the fact that one additional hospital was included in the 1948 calculation in Table VI, but it was omitted from Table VII because data were not available for the preceding years.

A reasonable prediction of the total deaths is not difficult to obtain from the estimated population and crude death rate. Trends in both can be taken into consideration. Data are also required on the proportion of all deaths which occur in hospitals. This had increased in Nova Scotia from 11 per cent in 1925 to 29.2 per cent in 1948. Fitting of an exponential curve indicated a tendency to level off at about 50 per cent. However, it would probably not reach a higher level than 35 per cent by 1960.

The second method of estimating the general hospital bed requirements for Nova Scotia was therefore based on the following:

- (1) The maternity bed requirements, as already discussed.
- (2) The regional five-year averages (1944-1948) of days of care per hospital death.

- (3) 35 per cent of all deaths to occur in hospital.
- (4) The average number of deaths in each region for the five years 1944-1948. This is a slight underestimate, since population growth was not taken into account, unless there is a corresponding fall in the crude death rate.
- (5) A 74 per cent bed occupancy for general hospitals, which was the 1948 average. This is probably an over-estimate because several small hospitals have been built since that time.

Table VIII compares three estimates of general hospital needs based on 5 beds per 1,000, 6 beds per 1,000 or the maternity needs and the bed-death ratio.

TABLE VIII  
GENERAL HOSPITAL BED REQUIREMENTS AS  
ESTIMATED BY THREE METHODS

Region	(1) 6 per 1000 Population (Re-allocated)	(2) 5 per 1000 Population (Re-allocated)	(3) Maternity Needs and Bed Death Ratio	Beds per 1000 in each Region		
				(1)	(2)	(3)
1	1,279	1,065	1,081	8.0	6.6	7.7
2	191	158	122	3.9	3.2	2.5
3	350	293	273	5.8	4.9	4.7
4	426	356	304	5.8	5.0	4.6
5	220	182	148	4.4	3.6	3.4
6	246	205	213	5.5	4.4	5.0
7	243	202	215	5.6	4.7	5.0
8	161	135	208	6.1	5.1	7.8
9	1,030	859	861	5.7	4.7	5.2
Total	4,146	3,455	3,425	6.0	5.0	5.0

These estimates are all calculated to give the approximate bed requirements by 1961. The figures in columns 1 and 2 are therefore larger than those shown in Table II, but they were calculated by the same method. The agreement is amazingly close between the total estimate of 3,455 beds based on the provision of 5 beds per thousand re-allocated according to the residence of hospital patients admitted in 1948, and the estimate of 3,425 beds based on the bed-death ratio and obstetrical bed requirement. It is so close that one is tempted to conclude immediately that all the effort of calculating requirements from birth and death statistics is unnecessary and 5 beds per 1,000 population, re-allocated according to the pattern of patient distribution, would be sufficient. However, a study of the regional estimates shows that these are allotted on a different basis, particularly in Regions 1, 2, 6, 8 and 9. Since the third estimate is based on the actual experience of each region over the last five years, it should provide a more realistic estimate than an arbitrary standard of 5 beds per thousand.

The most striking feature of this table is the wide range of demand for hospital services which it reflects, from 2.5 beds per thousand in Region 2 to 7.8 beds per thousand in Region 8. In particular, the high estimate in the latter region required careful study. It was even higher than the region containing the provincial base hospitals. This investigation eventually threw doubt on the validity of all of the above estimates, if plans are being made to meet the demands of a hospital insurance program.

It should be reiterated that these estimates are based not only on the probable birth, death and population statistics up to 1961, but also on the past experience or trends with respect to hospital usage. They may therefore represent a fair estimate of what the needs would be under the present system of medical practice and hospital administration. But the development of hospital insurance on a wide scale would introduce another important factor. If planning is being done with a view toward hospital insurance, all the above methods would probably provide grossly inadequate estimates.

Region No. 8 is an interesting example of the effect of hospital insurance after many years of operation. While the population of the Province as a whole had slightly less than 20 per cent coverage with Blue Cross Hospital Insurance in 1948, it is estimated that 75 to 80 per cent of the population of one of the two counties in Region 8 had such insurance and the second county also had a very high coverage. Exact figures are not available since the hospital insurance records of certain large companies, government employees, etc., are not available by county of residence. However, there is no doubt that one major difference between this area and others in Nova Scotia lies in the high proportion covered by hospital insurance. In fact, they had such insurance for many years before Blue Cross was organized, largely through co-operative plans of church sponsorship. Another feature is that the population of this region is now less than it was in 1901. It fell gradually from 1901 to 1931 and has remained relatively constant since that time. This has had an important effect on the age distribution of the population and hence on the incidence of chronic illness. Certain statistics for this region show how different the hospital usage is from that of the remainder of the province: 86 per cent of births and 36 per cent of deaths occurred in hospital in 1948, 453.4 days of hospital care were provided per hospital death, the bed capacity and bed complement exceeded the provincial average and almost equalled that of the region containing the base hospitals. Although the hospital facilities would seem reasonably adequate by ordinary standards, there was a long waiting list at the chief regional hospital, and in 1949 it was decided to enlarge this institution by more than 100 beds. Three other small hospitals have also been constructed or enlarged since 1948. The total bed capacity of this region in 1951 is 9.0 beds per thousand, which is higher than the estimate based on the bed-death ratio, but which according to present indications will be fully used.

It is believed that the experience in this area gives some indication of the probable demand for hospital care under a compulsory hospital insurance plan. Because of the older population the demand may be somewhat heavier than in other areas of more average age distribution, but on the other hand only 75 to 80 per cent have hospital insurance. Complete coverage under a compulsory plan would probably produce a similar demand in the whole province. One index of this is the fact that Region 8 provided 2,022 patient-days of care per thousand population in 1949, and the Saskatchewan Hospital Plan seems to be levelling off at about 2,000 patient-days.

The volume of general hospital care in Nova Scotia has risen from 503.3 patient-days per 1,000 population in 1925 to 992.3 patient-days per 1,000 in 1948. This has been a steady straight-line increase.

It is frequently stated that prepaid hospital insurance is largely responsible for this growth in hospital services. There is little indication that the growth of Blue Cross Hospital Insurance since 1935 has resulted in any major rise, although there might have been some levelling off in demand without it. Other factors were responsible for a great increase before the introduction of hospital insurance on a large scale, and have probably also accounted for some of the continued rise. However, Table IX indicates that the volume of hospital services per 1,000 population is greater in Region 8 where insurance coverage is high.

TABLE IX  
VOLUME OF HOSPITAL SERVICE PER 1,000 PER REGION  
IN 1948

Region	Patient-Days per 1,000
1	1,254.9
2	275.7
3	481.9
4	675.1
5	558.4
6	733.8
7	1,030.0
8	1,791.2
9	1,312.7
Nova Scotia	992.3

Although there is a wide range between other regions that have approximately the same insurance coverage, Region 8 stands at the top of the list. One cannot be certain that the demand would reach the same volume in all regions if a compulsory hospital insurance plan were introduced, but the indications point in that direction. Region 9 also has fairly extensive insurance coverage under industrial "check-off" plans. It is interesting to note that it stands second in ratio of days of hospital care per 1,000 population. Both exceed Region 1, in spite of the added volume of care for non-residents which is credited to that area.

Observations on the volume of services and the bed requirement in areas where insurance coverage has resulted in approximately adequate hospital services therefore provide a third method for the estimation of future hospital requirements. There have also been some morbidity surveys in which an attempt was made to evaluate what volume of service should have been provided, as well as determining the actual services rendered. One such study was that of Lee and Jones in 1935 (4). It is the writer's opinion that only estimates based on such experience or surveys can give a worthwhile prediction of the facilities needed under a hospital insurance plan. Any of the other methods reviewed above would provide gross under-estimates, as was the experience in Region 8.

Table X compares the actual or estimated volume of general hospital services in several studies. Falk's figures (3) are for the services rendered to a population during a sickness survey of one year. Lee and Jones' (4) are an estimate of the desirable level of services in another survey group. The Saskatchewan figures (6) indicate the rise in volume of services provided between 1947 and 1948 shortly after hospital insurance was introduced.

Nova Scotia was providing hospital care at the rate of 128.5 admissions per

1,000 population per year in 1949. This is above the Lee-Jones estimate of need, but is well below the Saskatchewan level. Region 8 had provided services for 147.9 patients per 1,000, and for a total of 2,022.3 patient-days. This is a higher patient-day volume than noted in any other area, although it is understood that the Saskatchewan figures for 1949 and 1950 have approached this level.

TABLE X  
VOLUME OF HOSPITAL SERVICES PER 1000  
PERSONS PER ANNUM

	General Hospital Admissions	Patient Days
Falk (services provided)	59	746
Lee-Jones (services needed)	107	1,385
Saskatchewan, 1947	156	1,565
Saskatchewan, 1948	178	1,878
Nova Scotia, 1949	128.5	1,120
Region 8, 1949	148	2,022

It is therefore doubted whether the estimate based on 5 general hospital beds per 1,000 population, or that based on maternity needs and bed-death ratio (which are almost identical in Nova Scotia), would be within 50 per cent of the final requirements under a hospital insurance plan. In Nova Scotia the present volume of hospital service in all but Region 8 is 957 patient-days per 1,000 per annum. This service is given with an average bed complement of 4.2 per 1,000. To provide 2,000 patient-days of care per thousand would require approximately 9 beds per 1,000. The experience of Region 8 and in Saskatchewan would suggest that 2,000 or more patient-days of care per 1,000 would be needed if the population were covered by hospital insurance. Possibly this service should be provided in different types of institutions, including general hospitals, chronic disease hospitals and nursing homes, but this aspect of the matter will not be discussed at present.

The inescapable fact seems to be that the proposed standard of 4.5 or 5 general hospital beds per thousand, with one or two additional beds for the chronically ill, or the estimate based on birth and death statistics and the bed-death ratio using past experience as a guide, are all totally inadequate to provide the services required to give adequate hospital care, particularly under a compulsory province-wide hospital insurance plan. If this fact is not recognized before an insurance plan is introduced and if the facilities are not provided, the resultant load on existing facilities might shortly be expected to produce conditions that would closely resemble chaos. Several experiments in this country and elsewhere would seem to confirm this prediction.

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## A Brucellosis Survey in Brant County, Ontario

N. V. SANDERSON<sup>1</sup>, D.V.M., D.V.P.H., R. H. KARN<sup>2</sup>,  
W. R. LeGROW<sup>3</sup>, D.V.M., and O. C. RAYMOND<sup>4</sup>, D.V.M., D.V.P.H.

EARLY in 1950, at the suggestion of the Department of Health of Ontario, the Brant County Health Unit applied for a National Health Grant to undertake a survey of brucellosis in Brant County. The grant was recommended by the Ontario Department of Health and approved by the Department of National Health and Welfare. The Ontario Veterinary College undertook to place its facilities at the disposal of the survey team, to test the blood of cows, and to pay veterinarians for taking blood samples. The Laboratory of the Ontario Department of Health, located at the Ontario Hospital, Woodstock, was also placed at the disposal of the survey. The field work was directed by a veterinarian recommended by Dr. A. L. MacNabb, principal of the Ontario Veterinary College, and by Dr. G. E. Edge, of the Ontario Department of Health.

The object of the survey was to determine the extent of brucellosis infection among humans. In order to locate the humans exposed to the infection, it was necessary to learn the extent of brucellosis among the cattle in Brant County. The *Brucella abortus* Ring Test, described by Fleishauer and Hermann (1937, 1938), was used.

This test, which is applied to whole milk, is an agglutination test and depends on the same basic principle as the well-known blood serum agglutination test commonly employed for the detection or diagnosis of Bang's disease. The immune substances or agglutinins which the infected animal produces are found in the milk as well as in the blood. The antigen or test fluid is very similar to that used in the rapid blood test except that it is stained a deep blue colour so that the agglutination reaction may be observed in the presence of whole milk.

In this test, the antigen and milk are mixed and incubated. If the sample contains milk from infected cows, the coloured antigen agglutinates and collects on the fat droplets. As the cream rises to the top, a deep blue cream line or ring is formed. The skim milk remains white. In milk from negative herds, the antigen remains in the skim milk fraction to give it a light blue colour, and the cream remains white.

Pooled milk samples from individual herds were collected at the receiving platforms in the various dairy plants of Brant County. Samples were also collected at the receiving platforms in two condensing plants in Brant and two outside condensing plants to which many Brant County producers shipped milk.

<sup>1</sup>Director of the Survey. <sup>2</sup>Director, Provincial Laboratory, Ontario Hospital, Woodstock.  
<sup>3</sup>Ontario Veterinary College, Guelph. <sup>4</sup>Brant County Health Unit, Brantford.

In this first phase of the search for brucellosis among cattle in Brant County, pooled samples of milk from 738 herds were ring-tested.

The second phase of the search consisted of the time-consuming task of visiting each farm in the county and collecting pooled milk samples from herds whose milk supply had outlets other than the fluid milk trade of Brant County. The surveys in the two small townships of Oakland and Onondaga were completed in the fall of 1950, and a start was made in Brantford Township. It is anticipated that it will take all of the summer months of 1951 to complete this second phase of the survey.

As pooled milk samples were collected, they were packed in ice and expressed to the Provincial Laboratory at the Ontario Hospital, Woodstock, where the ring tests were performed. Reports received from the laboratory recorded the results as negative, positive, or doubtful.

Owners of herds whose samples of milk were negative were immediately notified that the test had not revealed the presence of substances indicative of Bang's disease. They were warned that, although the result was gratifying, it should be borne in mind that further samples would have to be taken to insure that representative samples included all lactating animals in the herd. The herd owners were also urged to take every precaution to keep infected animals out of the herd.

No notifications were sent to herd owners whose milk samples gave "doubtful" reports. Repeat samples of pooled milk from such herds were taken as soon as possible. The problem created by these doubtful reports will be discussed later in this interim report.

Herd owners with positive reports were immediately sent a confidential report of the ring test on milk from their herd. They were reassured that the object of the Brant County brucellosis survey was not eradication by slaughter of suspected cattle. It was made plain that the main interest of the Brant County Health Unit was to find any undiscovered undulant-fever infection among people, so that the patients might be placed under treatment.

Finally, owners of positive herds were informed, in the same communication, that a member of the Health Unit staff would shortly visit them and explain the steps to take to control the disease.

All owners of positive herds were visited within a few days. At these visits, full information was sought as to the number of milking cows, number of dry cows, number of calves vaccinated against Bang's disease, number of other animals vaccinated against Bang's disease, and the presence of goats or other animals.

It was explained that the Ontario Veterinary College, Guelph, was co-operating with the Brant County Health Unit in the survey, and that the College would test all blood samples from individual cows, free of charge, if the herd owner would agree to call in the veterinarian of his choice to take the blood samples. Moreover, the College would pay the veterinarian a fee for each cow from which a sample was taken, and the only obligation of the herd owner would be to pay the regular call fee of his veterinarian. After the consent of the herd owner had been obtained, the veterinarian so selected was provided with blood-sample forms marked "Brant County Brucellosis Survey"

and requested to take the blood samples and mail them to the Ontario Veterinary College.

Having dealt with these matters, the representative of the Health Unit proceeded to seek full information from the owner of positive herds about persons living on the farm or employed there. The name of the family physician was also secured, and the consent of the herd owner sought to the end that all persons on the farm would go to this physician for blood tests. After the consent of the herd owner had been obtained, the family physician was requested to take the blood samples, informed that the Brant County Health Unit would pay a fee for each sample taken, and given special containers provided through the courtesy of Dr. E. L. Barton, at that time director of the Division of Laboratories, Provincial Department of Health. These containers were addressed to the Laboratory at Woodstock, and marked "Brant County Brucellosis Survey." The physician was at the same time informed that if undulant-fever infection was discovered, the patient would be his private patient and the Brant County Health Unit could assume no responsibility for treatment.

The survey conducted by the Brant County Health Unit has been finished for 1950, with the exception of 35 herds still to be blood-tested. Composite milk samples have been taken from 1,039 herds. Milk samples from 176 herds have shown a positive reaction to the ring test, and 1,515 head of cattle from these herds have been blood-tested for brucellosis. Three hundred and twenty-six humans have been blood-tested for undulant fever. These persons lived where evidence of brucellosis infection was found to exist. Many were consumers of raw dairy products. Twenty-six operators and employees of slaughter houses were included among those blood-tested.

Total composite milk samples.....	1,039
Total number with negative ring tests.....	863
Total number with positive ring tests.....	176
Percentage of herds infected.....	16.9

Milk samples reported to give a doubtful reaction to the ring test caused great concern. It was decided to take further milk samples and to consider three doubtful ring tests as positive evidence of infection. There were 29 such herds. This was a wise decision, as all such herds when blood-tested proved to be infected.

Milk samples from 19 herds showed doubtful ring tests on the first test and positive on the second. Milk samples from 5 herds gave doubtful reactions on the first and second tests and a positive reaction on the third. Milk samples from 11 herds showed doubtful reactions on the first test and negative on the second. Milk samples from 7 herds gave two doubtful reactions followed by a negative reaction. These variations probably resulted from the addition or removal of cows in the milking line, and from fluctuations in the titres of individual animals. If this explanation is correct, all doubtful reactions should be treated as though they were positive. It is of interest that the degree of positivity in a composite sample has no bearing on the actual number of cows infected. In the ring test, one strongly infected animal can show marked colouring in the cream line, whereas four or five cows with minimal amounts of agglutinins may show a weak color line.

*Results of Human Blood Tests*

Of a total of 326 humans tested for *abortus* agglutinins, 40 showed titres ranging from 1/25 to 1/200. These tests were set up in dilutions of from 1/25 to 1/800, using an *abortus* antigen supplied by the Laboratories of the Ontario Department of Health at Toronto. Positive and negative controls were set up with each group of serums.

Number of humans blood-tested.....	326
Number of positive blood tests.....	40
Number of positives without symptoms.....	38
Number of patients with undulant fever.....	2
17 persons had titres of 1/25	
16 persons had titres of 1/50	
5 persons had titres of 1/100	

One patient with symptoms had a titre of 1/50, and on re-test the titre rose to 1/100. The patient, a farm hand, then moved away and the family physician was unable to locate him. The other patient had a titre of 1/200 and rapidly recovered under treatment by the family physician.

## SUMMARY

The results of the survey up to date indicate that the incidence of brucellosis among the cattle population of Brant County, although not exceptionally high, is nevertheless a serious threat to the dairy industry.

As for the significance of brucellosis among the cattle of Brant County in the public health of the county, it is perhaps too early to speak. It is possible that the picture may change as the survey progresses into its final stages in the summer. It would appear, however, that many farm people attain some immunity to the disease.

The discovery of two unsuspected cases of undulant fever indicates that brucellosis in Brant County is a potential menace to the public health.

# Canadian Journal of Public Health

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## MORE ADEQUATE TRAINING FOR SANITARY INSPECTORS

IN this issue of the Journal will be found the reports of the Committees on Professional Education and on the Certification of Sanitary Inspectors. These reports were presented and adopted at the annual meeting of the Association in Montreal last month. The recommendations for the more adequate training of sanitary inspectors were made after consultation with the provincial and federal health authorities and with the Canadian Institute of Sanitary Inspectors. The unanimous endorsement of the proposals reflects the extended consideration given by all concerned and the members' desire to improve the training of sanitary inspectors so that they may be better equipped for the important work for which they are responsible in health departments.

Briefly, the recommendations provide that the training period will be nine months and that the course of training will be conducted in a health department. A period of nine months is recognized to be a minimum. It was felt that a more extended period, desirable as it would be, might be a serious deterrent, in view of the economic conditions which make longer training impracticable for most candidates.

Such a period of training has been considered to be essential, but was not practicable until financial assistance for candidates could be provided. Now, under the terms of the grants provided by the Government of Canada through the Department of National Health and Welfare, and with the participation of the Provincial Governments, training bursaries are available. In this, as in other fields, formal instruction is of great value, and it is encouraging that the University of Montreal has provided a course in sanitary inspection extending over a period of four months and including lectures, conferences, laboratory work and demonstrations. It is hoped that a similar course may be provided in some other university centre. In Manitoba a ten-month course for sanitary inspectors was initiated last month by the Division of Environmental Sanitation of the Provincial Department of Health and Public Welfare. Twelve men were selected to take the course, which consists of lectures, laboratory work and field work. The project is being financed by a federal health grant, which also provides bursaries for the trainees.

The term "formal course" is used to designate a period of instruction, usually three or four months, in which the candidate is engaged in attending lectures, demonstrations and laboratory exercises. The provision of such a course is expensive and can be undertaken only when there is a reasonable number of candidates. The number of applicants registered in all the Provinces for this year's examinations is only forty, and in view of the limited numbers who are likely to present themselves for certification within the next few years, following the introduction of the new training requirements, it probably will not be possible to provide more than two centres of formal training, one primarily for French-speaking inspectors, in the University of Montreal, and one in another university centre, to serve the rest of Canada. The course in Manitoba represents a special provision in that province in which instruction is extended over a period of ten months.

Candidates who cannot attend a formal course will continue to receive instruction through the correspondence course conducted by the Association. The course will, as in the past, occupy a period of six months, but its scope will be extended. These candidates will have nine months of supervised field work with a department of health, during which time they will take the correspondence course. Candidates who can attend a formal course occupying from three to four months will spend the remainder of the training period—from five to six months—in supervised field work with a department of health. These arrangements recognize the fact that candidates require the practical experience that can be obtained only in a health department.

With the establishing of this training period, to be effective for candidates taking the examinations in September 1952, it is essential that local municipalities and health units which are likely to require sanitary inspectors within the next two years should take steps to interest suitable men and to make application to their provincial department of health for training bursaries. Unless the significance of the new training requirements is appreciated and action taken, an adequate number of trained sanitary inspectors will not be available, as candidates who cannot meet the requirement of nine months' training will not be eligible to take the examinations in September 1952. It is essential, therefore, that the selection of candidates be proceeded with and that they be registered with the Association not later than December 1, 1951, so that they may complete their training by the date of the 1952 examinations. When accepting the training bursary, candidates agree to spend two years in public health work in Canada. The Association will assist candidates who desire to become sanitary inspectors by putting them in touch with municipalities that have expressed a need for additional inspectors.

The implementing of these regulations will constitute a great step forward in the training of sanitary inspectors. Without question, the way has been opened for future sanitary inspectors to have a more adequate preparation for their work. Next to the public health nurses, the sanitary inspectors constitute the largest group in health work, and the public's contact with the department is largely through the nurses and the sanitary inspectors. It is gratifying that the discussions of the past three years have resulted in a program that will meet Canadian needs in a practical way and will lay the foundation for further improvements in training.

# The Canadian Public Health Association

## 1950-1951

### PART II

#### REPORT OF THE COMMITTEE ON PROFESSIONAL EDUCATION

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Dr. V. C. R. Walker, Toronto

Representative of the Canadian Institute of Sanitary Inspectors: to be appointed

FUNDAMENTAL to the advancement of public health is the establishing of qualifications and the defining of the responsibilities of those engaged professionally in the various fields, so that appointments may be made on the basis of recognized educational and training qualifications. This is the responsibility of the Association's Committee on Professional Education.

In 1935 the American Public Health Association appointed a Committee on Professional Education and gave it the responsibility of preparing statements of qualifications for the offices of health officer, sanitary engineer, and other personnel. This committee has since established qualifications for all public health personnel, including the specialized fields, and has developed unique and highly effective examinations which State and municipal health departments and other agencies may obtain. The related professional societies have been consulted in the preparation of the reports, and the approval of the Association's members has been obtained after the publication of the reports in the American Journal of Public Health.

The reports of the American committee were prepared with such care and deliberation that the members of the C.P.H.A.'s committee felt that it would be a duplication of effort to start anew in formulating Canadian reports. The American Public Health Association generously acceded to the Committee's

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*Reports presented at the thirty-ninth annual meeting of the Canadian Public Health Association, held in the Mount Royal Hotel, Montreal, May 28-31, 1951, in conjunction with the annual meeting of La Société d'hygiène et de médecine préventive de la province de Québec.*



request that it be allowed to adapt certain of their reports for use in this country. The Executive Council of the C.P.H.A. approved a plan whereby the reports would be published in the Canadian Journal of Public Health as proposed reports for Canadian use and would be open to criticism for a period of eight months, after which they would be revised to include any constructive criticisms received by the committee. The revised report would then be submitted to the Executive Council for final approval, following which it would again be published in the Journal. As is the case with the American series of reports, this series of reports will be subject to constant revision in order to keep them up to date with the changing picture in public health.

To date, three reports of the American Public Health Association have been adapted for Canadian use:

- Report on Educational Qualifications of Medical Health Officers—published in the July 1947 issue of the Journal.

- Report on Educational Qualifications of Public Health Engineers—published in October 1947.

- Report on Educational Qualifications of Public Health Laboratory Workers—published in November 1947.

These reports were presented to the Executive Council at the annual meeting in Vancouver in May 1948 and approved.

At the 1948 meeting, the Committee on Professional Education was requested by the Executive Council to prepare, in co-operation with the Public Health Nursing Section, a report on the educational qualifications of public health nurses. At the request of the Section officers, action was deferred until the report of the Association's Study Committee on Public Health Practice, then just starting its work, was available. As this report has now been published, the Committee of the Public Health Nursing Section is proceeding with the preparation of a report on the educational qualifications of public health nurses.

In 1947 a request was made by the Canadian Institute of Sanitary Inspectors that the educational requirement for registration for the examinations leading to the Certificate in Sanitary Inspection (Canada) be raised and that an additional and higher certificate be provided. This request was referred to the Committee on Professional Education. After due consideration, the Committee made certain recommendations, in October 1949. The recommendations were studied by the Canadian Institute of Sanitary Inspectors, and in April of last year they expressed their views in a memorandum in which they recommended the raising of the educational requirement for registration and recognized the need for more adequate training, but were not in agreement with other recommendations of the Committee on Professional Education. As the memorandum required extended study, it was not possible for the Committee to prepare a report for presentation to the Executive Council at the annual meeting in Toronto last June.

On April 21, 1951, the Committee on Professional Education reviewed the recommendations as prepared in 1949 and the memorandum presented by the Canadian Institute of Sanitary Inspectors. Representatives of the Institute present at this meeting included Mr. J. Albert Hotte, Montreal, Dominion

president; Mr. J. Arthur Germain, Montreal, president of the Quebec Branch; Mr. John M. Homer, Hamilton, president of the Ontario Branch; and Mr. F. A. Lunn, Brampton, secretary of the Ontario Branch. The Committee were in agreement about the major matters, and the following recommendations relating to the qualifications and training of sanitary inspectors were unanimously approved.

### 1. *Preliminary Education:*

It was recommended that no change be made in the educational requirement for registration, which would continue to be junior matriculation or its equivalent.

### 2. *Training:*

#### (a) *Formal Instruction:*

There should be a formal course of instruction (full-time), provided in several centres in Canada and conducted under the direction of the Provincial Health Department. At present the University of Montreal is offering a course extending over a period of four months. It was felt that the formal course (including lectures, conferences, laboratory work, and demonstrations) should provide instruction for a period of from three to four months, varying according to the facilities available.

#### (b) *Correspondence Course:*

It was recommended that, until formal courses of instruction are available to all candidates, the correspondence course provided by the Association be continued and that it be improved by suitable revision and the addition of new material. This course extends over a period of six months and provides instruction under three main headings: Communicable Diseases and Vital Statistics, Environmental Sanitation, Food Sanitation and Public Health Administration.

#### (c) *Practical Experience:*

The present minimum requirement of two weeks of field work is entirely inadequate. It was recommended that the course of training extend over a period of nine months, so that five or six months of supervised field experience would be provided for those having the benefit of a formal course of instruction occupying from three to four months. For candidates who could not attend a formal course of instruction and until such courses are available for all candidates, the requirement would be nine months of supervised field training, during which time they would complete the correspondence course.

### 3. *Training under the Professional Health Grant:*

It is hoped that Provincial Departments of Health may be able to advance the training program through the utilization of the Professional Training Grant of the Federal Health Grants. On the basis of a course of training occupying nine months, it would be necessary to select candidates, to provide training stipends, and to arrange for the employment of these candidates on the successful completion of their course. This would call for action on the part of municipal departments of health, county health units, etc., in co-operation with the Provincial Departments.

#### 4. *Training through Apprenticeships:*

The Committee felt that the development of a plan of apprenticeships in health departments might be possible where training under the Professional Health Grant cannot be arranged. It was agreed that an apprenticeship in a health department would be an effective means of gaining practical experience, and that such trainees should be paid by the municipality. This plan would be practical where the candidate would have to depend on the correspondence course for his additional instruction. Otherwise, a problem arises in connection with assistance to a candidate to enable him to attend a formal course of instruction. It is possible that a municipality might continue his financial support while he was taking the formal course, particularly if he were to return to the health department.

#### 5. *The Examinations:*

Examinations for the "Certificate in Sanitary Inspection (Canada)" will continue to be provided. They will, as in the past, be conducted during the month of September in the various provincial centres, under the direction of the Provincial Departments of Health and with the co-operation of the Canadian Institute of Sanitary Inspectors.

#### 6. *Refresher Courses:*

It was recommended that consideration be given to refresher courses, to be provided, if possible, by the Provincial Departments of Health or by other agencies, including the Association, the Institute, and educational institutions.

#### 7. *Title of Office:*

The name "sanitary inspector" is considered to be preferable to any other title.

These recommendations have been presented to the members of the Committee who were unable to attend the meeting, including the Deputy Ministers of Health of the ten Provinces. Approval of the recommendations has been received. The implementing of the recommendations in regard to the establishing of courses of instruction will, it is hoped, be possible in at least one Province so that, with the course provided in the University of Montreal, there will be two centres of training. The Committee considers that these recommendations are of great importance, raising as they do the period of training to a minimum of nine months and requiring the completion of a formal course of instruction or at least the correspondence course conducted by the Association.

#### *Qualifications of Other Personnel*

At this meeting it was decided to proceed with the preparation of statements of qualifications for the offices of public health nurse, public health dentist, public health veterinarian, and public health statistician. Miss Edna L. Moore was appointed referee for the Committee on Public Health Nurses,

Dr. Glenn T. Mitton referee for the Committee on Public Health Dentists, Dr. V. C. R. Walker referee for the Committee on Public Health Veterinarians, and Dr. A. H. Sellers, referee for the Committee on Public Health Statisticians. The referees act as liaison between their respective committees and the general committee.

## REPORT OF THE SUB-COMMITTEE ON RECOMMENDED QUALIFICATION REQUIREMENTS AND MINIMUM SALARIES FOR PUBLIC HEALTH PERSONNEL IN CANADA

(Committee on Professional Education)

J. H. Baillie, M.D., D.P.H., Chairman  
William Mosley, M.D., D.P.H., Secretary

IN 1946 the Association established a Committee on Salaries and Qualifications of Public Health Personnel. At the request of the Dominion Council of Health, the committee carried out a survey of all official public health agencies in Canada. The report contained data about the salary ranges offered for the different types of professional and technical personnel, including also information about factors other than salary that affect income—pension plans, sick leave, holidays, car allowance, etc. Educational qualifications and experience were recommended for the majority of positions in health agencies, and a *minimum* salary level for each group or grade of position was suggested. These levels were considered to be the minimum salary that should be paid for the particular position or grade anywhere in Canada.

During 1948, information regarding salary and qualification changes that had been made since 1946 were obtained from the agencies participating in the first study, and a revised report was published in March 1949. Now, at the request of members of the Association and of one of the provincial associations, the Committee is undertaking a revision of the 1949 report. The ten Provincial Departments of Health, the Department of National Health and Welfare and two other Federal agencies, twenty cities, and twenty-six health units are co-operating in the revision. The work of correlating the information is proceeding and an interim report will be presented at this annual meeting. It is expected that the final report will be available in printed form in September.

These reports of the Committee, which now functions as a sub-committee of the Committee on Professional Education, have been appreciated by official and voluntary health agencies and by public health workers across Canada. As a result of the attention that has been drawn to the inadequacy of the remuneration of all groups in the public health field, there has been a revision of schedules in all the Provinces. The recommendations concerning educational qualifications and experience for the various positions in health agencies have been adopted by Civil Service administrators and by municipal authorities, and this part of the Committee's work has been particularly valuable. It is hoped that the Committee may be able to make an increasing contribution through the publication of these surveys.

## REPORT OF THE COMMITTEE ON THE CERTIFICATION OF SANITARY INSPECTORS

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Chairman

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O. H. Curtis, M.D., D.P.H., Charlottetown  
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C. S. Huband, C.S.I.(C.), Ottawa  
T. J. Lafrenière, C. E., Montreal  
D. J. Mackenzie, M.D., Halifax

J. A. Melanson, M.D., D.P.H., Fredericton  
Leonard Miller, M.D., M.P.H., St. John's  
William Mosley, M.D., D.P.H., Toronto  
L. A. Pequegnat, M.B., D.P.H., Toronto  
J. G. Schaeffer, M.Sc., Regina  
W. L. Smith, C.S.I.(C.), Toronto  
D. R. Stanley, B.Sc., Edmonton  
R. L. Randall, Toronto, Secretary

### Central Board of Registration and Examination

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Mr. C. S. Huband, C.S.I.(C.)	Mr. T. J. Lafrenière	Dr. William Mosley
Dr. L. A. Pequegnat	Mr. R. L. Randall, Secretary	

THE establishing of qualifications and the providing of training for any group of public health workers requires years of effort. In regard to sanitary inspectors, the efforts in Canada extend over a period of almost twenty years. It was in 1935 that the first syllabus and regulations were issued and the first examinations for the Certificate in Sanitary Inspection (Canada) held; five candidates obtained the certificate. Two years later the first edition of the Manual for Sanitary Inspectors was distributed. Initially, all employed sanitary inspectors were eligible to take the examinations. After a period of three years, candidates who had not served as sanitary inspectors for at least one year were required to present evidence of three years of high-school work or its equivalent. This was increased in 1939 to the present requirement of junior matriculation or its equivalent. In 1942 a correspondence course was introduced, providing instruction in communicable diseases and vital statistics, environmental sanitation, and food sanitation and public health administration, in three terms occupying eight weeks each. Step by step, the standards have been raised, and much thought has been given to the provision of courses of instruction which would be more adequate than the correspondence course now available. Of special interest are the arrangements in the University of Montreal which permit of the enrollment of sanitary inspectors in a course of instruction extending over a period of four months.

It can be truly said that substantial progress has been made towards the objective of establishing qualifications and providing training for sanitary inspectors. It is noteworthy that seven hundred and thirty-seven inspectors have qualified for the certificate.

The recommendations of the Committee on Professional Education, presented elsewhere in this annual report, include the continuation of the present educational requirement for registration—junior matriculation or its equivalent; the revision and extension of the correspondence course; and the requirement of a minimum of nine months of training. As financial assistance may be made available through the Provincial Departments of Health, utilizing the

Professional Training Grant provided under the National Health Grants, candidates can undertake full-time work under direction in acceptable health departments for a period of nine months. Candidates attending a formal course of instruction occupying from three to four months would be granted credit for the period thus spent in the requirement of nine months. The examinations for the Certificate in Sanitary Inspection (Canada) will continue to be held in the provincial centres during the month of September, under the direction of the Provincial Departments of Health and with the co-operation of the Canadian Institute of Sanitary Inspectors.

As chairman of the Committee, I feel that I should point out that the number of candidates enrolled for the 1951 examinations is hardly two-thirds the number who took the examinations in 1950. This year there are 42 candidates, distributed as follows: British Columbia 8, Alberta 5, Saskatchewan 2, Manitoba 7, Ontario 11, Quebec 1, Nova Scotia 1, and Newfoundland 5. By increasing the requirement to nine months of training, the number of candidates will probably be further reduced. Since the total number of candidates will be small, the provision of special courses of training will be difficult, if not impossible. It would seem, therefore, that training can best be provided (apart from those candidates who attend the course of instruction in the University of Montreal) through the development of a correspondence course and the practical experience gained in the nine months of supervised field work. To extend and improve the correspondence course will necessitate an increase in the fee. The Committee desires to recommend that the fee for the 1951-52 session be \$75.00, or \$25.00 for each of the three terms.

The recommendations made by the Committee on Professional Education as relating to the training of sanitary inspectors have been considered and approved by the Deputy Ministers of Health of the Provinces. It is gratifying that the Provincial Departments of Health have given their support throughout the years and that they will implement the recommendations as far as possible. The adoption of the requirement of nine months of preparation marks a most significant advance in the training of sanitary inspectors in Canada. The plan could not be undertaken without the assistance afforded by the Professional Training Grant of the National Health Grants and the generous co-operation of the Provincial Departments of Health. The immediate years will be difficult owing to the greatly reduced number of candidates who will probably be enrolled. The Committee believe that steps should be taken to acquaint high-school students with the opportunities of sanitary inspection as a career, making known the provision of training stipends and the availability of appointments.

The Committee has approved of granting exemption from the field inspection report and the written papers of the examination to those candidates who successfully complete the course of instruction provided in the University of Montreal. The Committee is very pleased to co-operate with the University and to have in return their appreciation of the work of the Association in establishing the Certificate in Sanitary Inspection (Canada). The Committee is particularly indebted to Doctor Jules Gilbert, secretary of the School of Hygiene, University of Montreal, whose interest in the Association and in the



training of sanitary inspectors has been unfailing. It will be recalled that it was through Doctor Gilbert's efforts in arranging to have the book translated that the Association was able to publish a French edition of the Manual for Sanitary Inspectors last year.

The 1950 examinations for the Certificate were held in Vancouver, Edmonton, Regina, Winnipeg, Toronto, Montreal, and Halifax on September 11, 12 and 13, under the direction of the Provincial Departments of Health and with the co-operation of the Canadian Institute of Sanitary Inspectors. Fifty-two candidates were successful. Eighteen candidates were enrolled for the 1950-51 session of the correspondence course, which opened on October 23rd and continued for a period of twenty-four weeks.

### REPORT OF THE COMMITTEE ON RECRUITMENT

William Mosley, M.D., D.P.H., Chairman

G. H. M. Hatcher, M.D., D.P.H., Secretary

THE Committee on Recruitment is pleased to report that during the past year a presentation of the subject of public health as a career has been made in the medical colleges of Canada, through the co-operation of the professors of preventive medicine. The Committee has again made available a pamphlet for physicians outlining the work of the medical officer of health and of specialist medical officers. Of necessity the pamphlet has been general in character but it contains specific information about fellowships for post-graduate training and includes the names of the Deputy Ministers of Health of the various provinces with whom interested physicians may communicate. The pamphlet also gives the provisions for certification as a specialist in public health by the Royal College of Physicians and Surgeons of Canada and by the American Board of Preventive Medicine and Public Health, Inc. In this connection, the Committee desire to record their appreciation of the excellent work of the committee named by the Royal College which, under the chairmanship of Dr. Donald T. Fraser, was charged with the responsibility for preparing recommendations.

The Committee are receiving reports from the Provincial Departments of Health about their needs for professionally qualified staff. It would appear that for the maintenance of the existing services the number of public health physicians, dentists, engineers, nurses and sanitary inspectors in training is inadequate to permit even of supplying replacements. Under present circumstances, it is almost impossible to undertake the extension of full-time local health services required for the large part of the population now without them. Recruitment, therefore, must relate to all groups of professionally trained personnel. In the United States, a situation which was already acute has been made desperate by the enrollment of personnel in the Services. To an increasing extent, Canadian public health workers will be drawn to the United States because of the very attractive positions which are available. The Committee recommend that pamphlets be prepared presenting the opportunities in each field of public health and that undergraduates in medicine, engineering and other professions be supplied with information and be encouraged to think of careers in public health. To this end, the Committee will welcome suggestions and assistance.



## REPORT OF THE LABORATORY SECTION

F. O. Wishart, M.D., D.P.H.  
Secretary

THE 1950 MEETING of the Laboratory Section was held in the Chateau Laurier, Ottawa, on December 18th and 19th. The first day and the morning of the second were devoted to the presentation of papers. A variety of interesting subjects was discussed, including antibiotics, ACTH, and bacteriophage metabolism. The second afternoon was given over to visits to local laboratories—the Laboratory of Hygiene, the Food and Drugs Laboratory, and the Laboratories of the Animal Diseases Research Institute. The registration was slightly more than one hundred and included representatives from all the Provinces as well as a few American visitors.

The dinner meeting was attended by the Hon. Paul Martin, Minister of National Health and Welfare, and by Dr. G. D. W. Cameron, Deputy Minister. The Hon. Mr. Martin gave a brief address of welcome in which he reviewed the support by his department of all health activities in Canada, with special reference to laboratory services. The guest speaker of the evening, Mr. W. T. D. Atkinson, principal of Glebe Collegiate, Ottawa, gave a delightful address on the subject of limericks.

The main topic of discussion at the business session was the formation of a Canadian Association of Microbiologists. The problems relating to this new society and its relationship to the Laboratory Section were fully discussed and it was decided tentatively to hold an organizational meeting in Ottawa in June 1951.

The Executive of the Laboratory Section elected for 1951 was as follows: Chairman, Dr. R. G. E. Murray, London; Vice-chairman, Professor E. Morin, Quebec; Secretary, Dr. F. O. Wishart, Toronto; Council: Dr. E. L. Barton, Guelph, Dr. A. Frappier, Montreal, Mr. J. Gibbard, Ottawa, Dr. R. J. Gibbons, Ottawa, Dr. A. L. MacNabb, Guelph, and Dr. C. A. Mitchell, Hull.

It was decided that the 1951 meeting would be held in Toronto.

## REPORT OF THE COMMITTEE ON MEMBERSHIP

C. W. O. Moss, M.D., D.P.H.  
Chairman

TO BE REPRESENTATIVE of public health in Canada, the Association must have every public health worker as a member. In the reports of the executive committee, the honorary treasurer, and the editorial board, the subject of membership is presented. The Committee on Membership is developing plans for presenting the membership appeal primarily through the provincial public health associations. Much thought has been given to the preparation of a folder describing the Association and its work and the functioning of the provincial associations. Copies of this folder will be sent to all public health workers in Canada, inviting their membership. It is hoped that by the time the Association holds its next annual meeting, the Committee will be able to report a very substantial increase in membership.

## NEWS

### British Columbia

TWO ADDITIONAL DENTISTS have joined the staff of the Division of Preventive Dentistry, Department of Health and Welfare: Dr. V. B. Siegel, a graduate of the Faculty of Dentistry, University of Toronto, and Dr. V. P. Gilbert, a graduate of McGill University. Dr. Siegel has been appointed dental director of the North Okanagan Health unit at Vernon and will work in school districts 19, 21 and 22. Dr. Gilbert has been appointed in a similar capacity to the Upper Fraser Valley Health Unit at Chilliwack and will carry out his program in school district 33.

WITH THE AID of the Public Health Research Grant, an investigation is now under way to determine the number of lakes in the interior of the province that are infected with the schistosome causing swimmer's itch. The research project plans to study the life cycle of the schistosome and possible control measures.

A PILOT STUDY of a new type of tuberculosis survey will soon be under way in the Upper Fraser Valley Health Unit. This study will be in co-operation with the B.C. Tuberculosis Society. It is planned to conduct a continual survey, utilizing members of the Junior Red Cross, who will be responsible for all appointments, rather than the usual form of concentrated survey. The results of this study will determine the type of tuberculosis survey best suited to this province.

### Saskatchewan

DONALD MACRAE, M.B., Ch.B., M.D., has assumed the duties of acting director of the Division of Venereal Disease Control in the Department of Public Health. He is a graduate of the University of Glasgow, Scotland. Since coming to Canada, Dr. MacRae has worked with the Saskatchewan Cancer Commission as clinical associate and has spent some time in private practice. Previously, Dr. MacRae was with the Department of Public Health in Paisley, Scotland, as senior resident medical officer at the Dykebar Mental Hospital and, later, with

the Glasgow Department of Public Health as senior resident medical officer at the Ruchill Fever Hospital.

M. K. DEHNEL, M.D., D.P.H., a graduate of the University of Warsaw, Poland, has been appointed regional medical health officer for the Assiniboia-Gravelbourg Health Region. He completed recently the course leading to the Diploma in Public Health at the School of Hygiene, University of Toronto. After several years' experience in Poland as a resident hospital medical officer, as a school medical officer, and as a private practitioner, Dr. Dehnel joined the medical corps of the Polish forces then under British command. After the war, he continued to work with the armed forces in England until his discharge in 1948, when he was employed by the British Ministry of Health.

AFTER A TWO-MONTH orientation course, health educators have been assigned to three of Saskatchewan's health regions. William F. J. Anderson will work in the Assiniboia-Gravelbourg Health Region, Walter Podiluk in the Weyburn-Estevan Health Region, and Donald Flury in the Prince Albert Health Region.

DR. A. E. CHEGWIN, director of the Division of Dental Health, was elected chairman of the dental public health section of the Canadian Public Health Association at the recent convention in Montreal.

BURSARIES for the training of six dental hygienists at American dental schools have been approved under the Federal Health Grants. These hygienists will be employed in regional dental programs to assist dentists in examinations and dental prophylaxis, and to carry on general dental health education among children in the health regions.

FLUORIDATION of water supplies for the partial control of dental caries has been recommended by the Department of Public Health. The general public has shown considerable interest in this project and the cities of Regina, Saskatoon, and Moose Jaw are

giving active support to it. Inquiries have been received also from service clubs and persons interested in the problem of dental disease. The Sanitation Division and the Provincial Laboratories are collaborating with the Dental Health Division in providing information and making arrangements for carrying out fluoridation programs when approved by local authorities. An effort is being made to interest local dental groups in making sample statistical surveys of the dental condition of children in these communities so that an evaluation can be made of the results of fluoridation.

### Manitoba

DR. J. N. R. SCATLIFF has been appointed medical director of the Red River Health Unit by the Manitoba Department of Health and Public Welfare. Dr. Scatliff was awarded the Diploma in Public Health by the senate of the University of Toronto at convocation this spring.

DR. FRANK CHOWN replaces Dr. Paul L'Heureux as medical director of St. Boniface Health Unit. Dr. L'Heureux is now medical superintendent of St. Boniface Hospital.

DR. V. S. HAWKES has been appointed medical director of Selkirk Health Unit by the Manitoba Department of Health and Public Welfare. He moves from a similar post in the Stonewall Health Unit.

DR. J. M. O'KEEFE, newly appointed medical director of the Stonewall Health Unit, was awarded the Diploma in Public Health by the senate of the University of Toronto at convocation this spring.

THE OFFICIAL OPENING of a ten-bed medical nursing unit at Rossburn was held on June 14. The new hospital serves the municipality of Rossburn and the surrounding district and was constructed at a cost of \$72,000. It has been in partial use since September of last year.

MR. GEORGE NICK of Winnipeg has been appointed assistant director of the Physical Fitness Division, Manitoba Department of Health and Public Welfare. A former field supervisor of physical training and community centres for the division, he received leave of absence in 1947 to complete courses at the University of Toronto in physical

education. For the past year, Mr. Nick has been on the staff of the University of Toronto as an associate in physical education.

A TEN-MONTH COURSE for sanitary inspectors, sponsored by the division of environmental sanitation of the Manitoba Department of Health and Public Welfare, opened in Winnipeg on June 18. Lectures and laboratory work will be provided for the twelve men selected to take the course, which is under the direction of Mr. Mark Flattery, chief sanitary inspector of the division. A federal health grant finances the project and provides a bursary for each trainee. Upon completion of the course, the students will write the examinations for the Certificate in Sanitary Inspection (Canada), conducted by the Canadian Public Health Association.

DR. W. L. BELL arrived from London, England, early in June, to take up his work with the Manitoba Department of Health and Public Welfare as medical director of the Brandon Health Unit.

MISS WINIFRED BARRATT of Winnipeg attended the Ottawa conference of key nursing groups related to Canada's civil defence training program, held in Ottawa June 11-13. Miss Barratt is registrar and consultant for practical nurses with the Manitoba Department of Health and Public Welfare. She was one of the Canadian nurses sent to Minneapolis, Minn., last January to attend a conference on nursing aspects of atomic warfare. Miss Lillian Mackenzie, director of public health nurses for the City of Winnipeg, and Miss Dorothy Dick, assistant director of Public Health Nursing Education for the University of Manitoba, also attended the Ottawa conference in June.

DR. L. T. KURLAND of Baltimore, Md., arrived in Winnipeg in mid-June to direct a neurological research unit for the study of multiple sclerosis. A companion project will be carried out in New Orleans, La., when studies in Winnipeg are completed. Dr. Kurland and his associates plan to compare symptoms, diet, previous infections, occupation, and emotional stability of diagnosed multiple sclerosis patients of the Winnipeg area with those of New Orleans. They will check for variance in geographical, climatic and racial factors in the companion studies to help determine reasons for a 3.6 to 1 preva-

lence of the disease in Greater Winnipeg as compared to New Orleans. Working with Dr. Kurland in the research unit are Dr. Knut Westlund of Oslo, Norway, Dr. A. T. Mathers of Winnipeg, a public health nurse, Miss Marion O'Neill of Baltimore, and the executive secretary, Mrs. W. P. Dean of Winnipeg.

### Ontario

MR. JOHN C. SCOTT has been appointed director of publicity for the Ontario Department of Health.

DR. D. W. A. TEMPLETON has resigned as assistant medical officer of health of the Porcupine Health Unit to go into group practice in Timmins, Ontario.

WITH THE OBJECTIVE of enrolling all members of health departments in the Ontario Public Health Association, an active program is being conducted under the direction of Dr. L. A. Pequegnat, secretary of the organization. Information about the association is being sent to all health workers in the province. The Ontario Public Health Association has been established as a division of the Canadian Public Health Association and a joint fee for membership in both organizations has been arranged. This is part of the national membership program which is being forwarded by a committee under the chairmanship of Dr. G. W. O. Moss.

### New Brunswick

BECAUSE of the high infant mortality rate in New Brunswick, special emphasis was placed on efforts to reduce the prevailing mark as the first Public Health Nursing Institute in New Brunswick was held at Saint John in June. Miss Muriel E. Hunter, Fredericton, Director of the New Brunswick Public Health Nursing Service, presided over the three-day gathering and brought her entire staff of nearly two dozen with her. Miss Mona Wilson, Director of the Provincial Public Health Nursing group in Prince

Edward Island, attended with nine of her staff. The successful venture was put on by Miss Ann Peverley, Assistant Professor of Public Health Nursing at the School of Nursing, McGill University. Assisting were Miss Elizabeth Logan, specialist in pediatric nursing at McGill University, and Dr. A. D. Gibbon, Saint John pediatrician. More than 50 nurses were present, including members of the Victorian Order of Nurses in New Brunswick and nurses of the Saint John sub-district Board of Health. Provincial Minister of Health and Social Services for New Brunswick, Hon. Dr. F. A. McGrand, spent the major portion of a day at the Institute. The Maternal and Child Health program was the main theme.

ENVIRONMENTAL SANITATION direction by District Medical Health Officer has come to New Brunswick, following a 10-day course of instruction in Fredericton, attended by the nine sanitarians of the province. This group returned to their respective posts well qualified to carry out the program envisaged for the last 30 years by health authorities in the province. Under the direction of A. J. Cameron, Provincial Sanitary Engineer, the sanitarians were given lectures and demonstrations in all phases of water supply, sewage disposal, bacteriology, dairy and milk sanitation, lighting, heating and ventilation.

THE SEMI-ANNUAL CONFERENCE of the New Brunswick Health Department's Directors of Services and District Medical Health Officers, held in Fredericton late in June, dealt with every subject under the provincial set-up from tuberculosis to influenza, cancer to fluoridation of drinking water, and mental diseases to civil defence. Dr. J. A. Melanson, Chief Medical Officer of the Province, presided over the two-day sessions. The five-month flu epidemic resulted in 4,851 cases being reported in the province and led to 102 deaths, but the provincial epidemiologist, Dr. G. G. Hatfield, believed the total to be ten times the reported official figure.

